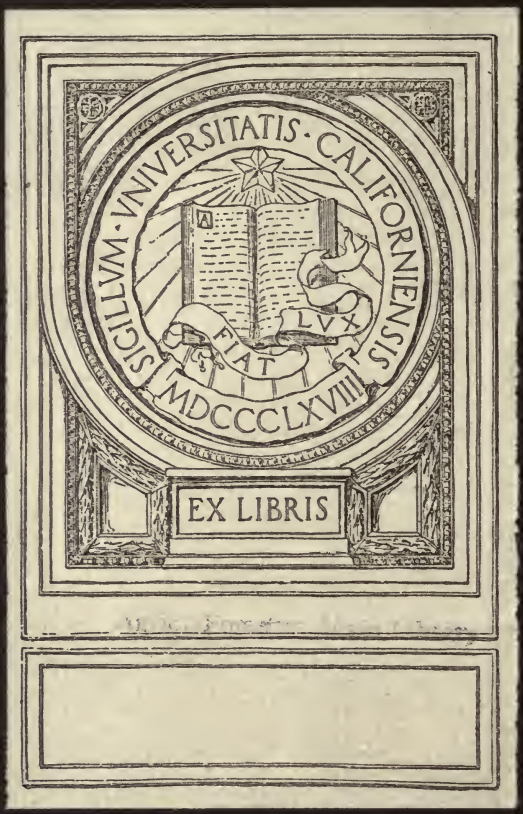
THE TRI-STATE FORESTRY
CONFERENCE
Ohio, Illinois & Indiana
Oct. 1919
Dept. of Conservation, State of Indiana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The Tri-State Forestry Conference

Ohio, Illinois and Indiana

October 22 and 23, 1919

Management of

The Department of Conservation

State of Indiana

THE DEPARTMENT OF CONSERVATION

STATE OF INDIANA

Publication No. 10

The Tri-State Forestry Conference

OHIO, ILLINOIS, INDIANA

INDIANAPOLIS, INDIANA
CLAYPOOL HOTEL
OCTOBER 22 and 23, 1919

MANAGEMENT
OF
THE DEPARTMENT OF CONSERVATION
STATE OF INDIANA

FORT WAYNE PRINTING COMPANY
CONTRACTORS FOR INDIANA STATE PRINTING AND BINDING
FORT WAYNE, INDIANA
1920

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THE TRI-STATE FORESTRY CONFERENCE

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WEDNESDAY MORNING SESSION OCT. 22, 1919.

The meeting was called to order at 10:00 a. m., with Hon. W. A. Guthrie presiding.

HON. W. A. GUTHRIE: Fellow citizens, we welcome you here today. It is quite fitting that the Tri-State Forestry Conference should be called here in the center of what has been the finest hardwood forest of the United States.

We are now entering upon an era which will witness a great advance in the reforestation which should produce and conserve our timber. The shortage of timber is a source of concern to many wood working plants and to plan for the future will give forth much for you gentlemen to work out. Our States have produced some of the best and most valuable timber of the nation. We have had such an abundance of timber that we have overlooked the rapidity with which we have been using it, and now we are unable to supply the demand.

Ohio, Illinois and Indiana are three of the seven states whose supplies feed the world. We are in the lead in live stock, agriculture and manufacturing.

Many of our sister states are ahead of us in the reforestation and are appropriating more money for this work. Pennsylvania appropriates $315,000.00 each year and has a holding of over six or eight million dollars. New York $288,000.00, Michigan $115,000.00 and many of the states from $25,000.00 to $75,000.00. Indiana has only been appropriating $7,400.00 for all purposes. Many foreign countries control their forests by handling scientifically and they are able to pay a revenue of three or more per cent, at the same time keep their forest intact.

Statistics show before the war that Belgium had a population of 652 to the square mile and yet had 18% in timber. Switzerland 235 population to the square mile with 23% in timber. France 190 to the square mile with 23% in timber. Germany 25%, Austria 35%, yet in Indiana with only 75 population we have less than 10% in timber.

The future of the timber problems of the three states are similar and it is for this reason that the three states have met here for this conference. If the timber supply for the future is to be assured then the wood using industries of the states must understand better how to control the influences which are now at work destroying the supply.

The public must take an immediate interest in the timber lands and see that legislation is enacted which will make for the use of permanent mill, forest development, place timber on the market only as needed, give adequate forest fire protection and assure renewal after logging.

We have with us today some very able and distinguished gentlemen, men who are authority along different lines, so we know that much good should come out of this convention and that we should work out some plan which will bring about better forestry development. We had arranged today for your chairman, a man who had been foremost in forestry, who is President of the American Forestry Association,—Mr. Charles Lathrop Pack—but who was taken seriously sick and sent this telegram last night: "Mr. Richard Lieber, Indianapolis: I am disappointed not to be able to be in Indianapolis tomorrow. I am confined to my room with a hard cold in my throat. My doctor forbids my going out of doors. Wish the conference every success and send best greetings. Charles Lathrop Pack."

Indianapolis always has been ready to take the place if one falls out and we have invited one of our leading citizens who is the head of one of our largest financial houses, whose name stands out for honesty, integrity and ability and who was the fuel director of the State during the war. It gives me great pleasure to introduce to you Mr. Evans Woollen of this city. (Applause)

MR. EVANS WOOLLEN: I have protested to Senator Guthrie that there is no appropriateness in his invitation. Perhaps an excuse for it and for my acceptance of it may be found in the fact that during my service as Federal Fuel Administrator for Indiana, I came to some measure of appreciation of the importance of the conservation of fuel supplies and this realization was confirmed later during a meeting in Washington of the coal dealers when they were talking of substituting wood for coal. However, whether appropriately here or inappropriately, I am glad to have the privilege of greeting you and presenting to you Hon. James P. Goodrich, Governor of Indiana. (Applause)

HON. JAMES P. GOODRICH: Mr. Chairman and gentlemen of the conference, I am glad to add a word of welcome to you and to thank you for coming here today.

Conservation is looked upon with a sort of mild tolerance. It was just about ten years ago that we started to think about it at all. We are just beginning to realize how prodigal had been our waste of the great basic resources of our country. We are just beginning to awaken to the fact that we have wasted them in an almost criminal way. I have lived my whole life in Indiana. I was born at a time when the forest land far exceeded the clear land and I have seen millions of feet of walnut and poplar and the best white oak that ever grew out of the ground wasted in this State. We are now having to get our supply from the south and southwest to keep our factories going. It is a tremendous difficulty, because with the increasing freight rate, it becomes more and more difficult to get it.

And so we need to look out for the waste lands of these three States and begin to regrow the forests that we have wasted to undo the mistakes of the past as nearly as we possibly can. We have hundreds of thousands of acres of land in Indiana that can't be devoted to agriculture that could be used to raise timber. We must remember that we are not engaging in this work for the immediate future, it is more for the far distant future. The trees that we plant today will not come into com-

mercial use until our grandchildren are running this country. It is the work for tomorrow and for the future of our country. I take it that the trees that are planted as a result of this meeting which will come to their full growth perhaps in a hundred years from now will be the breathing spots and play grounds. We are not spending very much money, but we are getting results, buying up small tracts of forests, putting state parks here and there over the State.

I am glad to have you here. I congratulate you upon the great work in which you are engaged because of what it means to the future of our country. It is a public question. But you can't afford to grow forests on land worth two or three hundred dollars an acre. It don't pay and private owners can't do it.

I really know so little of this question and some of you men here are so much better able to speak upon the subject than I am so I am going to give you a chance to talk. I thank you. (Applause)

MR. WOOLLEN: Governor Cox and Governor Lowden have found it impossible to be present. We will now have the satisfaction of listening to Mr. Edmund Secrest, Forester of Ohio. (Applause)

MR. EDMUND SECREST: Mr. Chairman and gentlemen of the convention, I am certainly glad to be with you this morning to tell you something of forestry conditions in Ohio.

Ohio is a state of relatively small farms, the average of which is eighty-eight acres. The lands in farms or forest tracts aggregate twenty-six million acres and of this area approximately one million, three hundred thousand acres, or five per cent. could be utilized in some form of agricultural development. There are three million, five hundred thousand acres of woodland in the State of which some five hundred thousand acres are in large buildings, other than farm lands in southeast Ohio. The average farm woodland is twelve acres in extent. The composition of the native forest is predominantly hardwood with occasional sporadic coniferous areas in the Ohio river countries.

The farm woodlands on eighty per cent. of the State's area are on land of considerable agricultural value. These tracts are being encroached upon directly by clearing for tillage or pasturage, and indirectly by live stock grazing. It may be expected as a matter of course that woodlands on lands of high productive value will gradually lessen in extent, with more intensive agricultural practices superinduced by a greater demand for farm products, and the decreasing size of farms. The woodlands of this type were representative of the most valuable hardwood forests of the country. It is from them that much of the raw material for the wood using industries is obtained for they contain the great bulk of the remaining original forests of the State. First quality white oak, red oak, yellow poplar, white ash, black walnut and elm came from the most productive soils, and strange though it may seem, the farm woodlands of central and northern Ohio contain the original stands, while those of the inherent timber soils of southern Ohio passed over a half century ago. A logical land classification would place this class of farm woodlands within the zone of agricultural production. On the other hand, their passing will require time for there are many landowners who cannot be persuaded to part with

their woodlands even though they exist upon land of high value. Probably their number will increase; certainly there has been a decided change in attitude and sentiment during the past decade in favor of woodland maintenance. Nevertheless we cannot escape the conviction that woodlands on land worth from one hundred to three hundred dollars per acre need not be considered a dependable future resource. Economically these acres represent in the aggregate a considerable loss to the commonwealth. The mere fact that they occupy lands of high value even though they be productive forests would in itself constitute misutilization. Through the deterioiating influence of grazing these detached bodies of native forest for the most part are cumberers of the ground with the original trees mature, or culls, the young growth lacking or of inferior composition, the shade too dense for the growth of nutritious grasses, these tracts are neither good forest nor good pasture. It is true that many of them can be rehabilitated. In fact by proper protection and management, regeneration by natural seeding is most satisfactory.

There is a field for farm forestry within the regions mentioned—the steep slopes along streams, overflow lands, ravines, etc., which could be given over more profitably to timber growing than other purposes. The farmer's interest in this phase is fortified by the direct benefits accruing from the small woodland. From it he would have available for farm use material for construction, posts, fuel, etc. He will appreciate more and more the value of shelter belts, both for protection and utility. It may be expected that such forestry can be promoted with moderate success in the better agricultural sections, and some progress has been made in this direction.

Before leaving this phase of the discussion it may be well to state that hundreds of farmers are attempting in greater or less degree to maintain and manage their small woodlands in accordance with recognized principles of forestry, without regard for the value of the land on which they exist. From this fact, however, there can be no outgrowth of established policy with reference to such tracts, nor even will there be any assurance that the successors to the property of these men will continue their practices.

The unglaciated hill lands of the southeast quarter of Ohio are the inherent timber areas of the state. A million acres could be devoted to this purpose without infringing on agricultural development. The woodlands in this section are in holdings of from two hundred to twenty thousand acres, small portions of which are utilized for desultory farm operations. Surface land values range from two dollars to twenty-five dollars per acre. During the early part of the last century, the original forest was taken up in large holdings by furnace companies, which led to the development of the charcoal iron industry. The timber was converted into charcoal which was utilized in the reduction of the local ore. Up to the time of the collapse of this industry in the early seventies, not only the original forest but oftentimes second growth and even third growth was used. The successive cuttings affected the composition of forest, but the most deleterious results occurred through the conversion of high forest to coppice, and the weakening of the reproductive capacity with each cut-

ting. Following this period the surface lands were almost abandoned, excepting that such portions which could be tilled were cleared and farmed. As the woodland developed it was again cut over principally for tie timber. The promiscuous clearing for tillage has complicated the problems involved in rehabilitating these areas, converting steep hill sides into fields has always been a common practice. Lack of soil fertility or indifference as well as difficulties in maintaining the fertility leads to the abandonment of the land resulting in a reversion to the old field type of forest. This type is difficult to deal with because it is so inferior in composition and stand, resulting oftentimes in mere weed growth.

Artificial reforestation by private individuals of the old field where the typical growth prevails in impracticable in many instances because of the excessive costs of formation and subsequent cleaning. The native forests under a system of management will be a valuable asset to the state for they are considerable, and are an inherent part of that section. Protection against fires is needed but damage of consequence is limited to a few counties where wild lands are in the hands of absentee land lords. Many owners are exercising vigilence in respect to this feature, but a sytem of state and national aid is needed. The generally prevailing indifference in attitude toward the proper maintenance of the forsets in this section is a factor which must be considered in this discussion. There are a few large tracts held for the value of the second growth alone. A considerable portion of southeast Ohio is underlaid by the coal measures, and many of the furnace tracts are in the hands of coal operators. They own the surface along with the mineral rights in most instances. Their business is to mine coal and the surface to them is of consideration only as it affects their mining operations. They value the woodland insofar as it contributes timber to supply the needs of the mines until they are worked out. Beyond that they have no immediate interest, for they are not in the timber business. However much they may be censured for neglecting their woodlands, there are obstacles in the way of forestry practices. There are no markets for inferior timber. Coal and gas have practically driven fire wood out of the market. Charcoal production barely more than pays for cutting the wood and burning the coal. In fact, many tracts are turned over to burners to coal for the price of the wood. The stumpage paid for pit props is so small that transactions are never based on that product. Tie timber is virtually the first product from second growth forests for which there is ready sale. Inability to dispose of the lower grades of timber is a discouraging feature, and is certainly a deterrent in the practice of forestry by private owners.

The present State Forestry Department was organized by legislative act in 1906. It was placed under jurisdiction of the Board of Control of the Agricultural Experiment Station. Broad power was given the Board along investigational and demonstration lines, but there was no provision for forest protection. In 1914 by special enactment the Board was authorized to purchase lands for state forests. The work of the Department has been substantially along the following lines.

(1) At the outset a preliminary forest survey of the State was made with the detailed surveys of certain counties. This was done to determine the conditions, the needs, and the lines of work required.

(2) Assistance to private owners, state, municipal and private institutions in the management of their woodlands and in reforestation projects.

(3) The station has maintained nurseries for the propagation and distribution of planting stock for reforestation. Heretofore the distribution of stock has been limited largely to experimental and demonstration work.

(4) Forest arboretums have been established on a number of public and quasi public institutions.

(5) Three municipal forests and forest parks have been established under the direction of the Department, one of which is primarily for the protection of the potable water supply.

(6) Two state forests have been purchased and these areas are used for experimental and demonstration purposes.

(7) A survey of the important drainage basins made in 1913, following the unprecedented flood of that year.

(8) During the past five years more attention has been given to problems of forest utilization. This phase in fact has grown to one of most importance. It is felt that the Department can be of real help to the woodland owner, and the wood user. The average owner has little conception of timber values, but has to proceed in marketing his products. He has great difficulty in finding markets for many classes of timber. In these matters we have been able to render assistance of considerable consequence.

It has also been possible to locate and to secure for wood users certain classes of timber which they desire and to cause mature or over-mature timber to be placed on the market. The effect of such work on the whole as we view it, is that it tends to create or to stimulate stagnant markets for the various classes of woodland products. The time of two of our men is largely given to this work, one of whom has had some years of practical experience in the timber business.

It was found at the outset that land owners were seeking information regarding the lasting qualities of the several kinds of post timbers. The Department undertook to investigate this matter with the result that data were obtained on some ten of the most common timbers. This work embraced the examination of three hundred fifty fences containing over forty thousand posts, the fences ranging in ages from four to fifty years. These data brought out many interesting facts, chief of which being that there is considerable variation in the durability of different wood of the same species, and that the relative scale is based not upon the length of life of one or several posts of a given species, but upon the average of great numbers. Data has been collected on the average stands per acre by counties of the different commercial tree species of the State. The results of this work is now on press and it will give fairly accurate data to wood users and others on the amounts and distribution of the available commercial timber.

(9) Cities have from time to time requested assistance in the planting and care of shade trees. Since they contribute indirectly to the support of the Department it was felt that they were entitled to such assistance. Shade tree surveys are therefore made upon request, and consid-

erable interest has developed in this respect. The need of such work is so evident in the average city, that it scarcely merits comment. It has resulted indirectly in much good to the Department, chiefly in securing wider moral and financial support.

(10) From the outset it has been the conviction that experimentation and research was vitally necessary for the development of forestry under Ohio conditions. We in fact have assumed the attitude that such work is fundamental in the working out of a stable forest policy for Ohio. It is hardly to be conceived how best results can be obtained without definite knoweldge of many facts we do not have. We need to have these facts before we can answer many questions now pending, and it is to be regretted that it is going to take so long to learn them. It is to be our policy, however, to understand more work of this character than it has been possible to do in the past. (Applause)

MR. WOOLLEN: The meeting will now be addressed by Mr. R. B. Miller, Forester of Illinois. (Applause)

MR. R. B. MILLER: Mr. Chairman and gentlemen, it is the intention in this paper to discuss very briefly those forest influences and problems in Illinois which are vital to a forestry policy, which are also common to Indiana and Ohio and which will furnish a committee from this conference some definite basis upon which to work when they summarize its findings.

You have only to look at some of the topographic sheets which the United States Geological Survey and the State Geological Survey are making in Illinois to assure yourself that it is not entirely a prairie State. According to Professor J. G. Mosier, of the Soil Survey of Illinois, in the sixty-two counties covered by the survey prior to 1917 there are 3,434,625 acres of broken and hilly land which should be in timber. Going over the remaining forty counties, for which reports have not been finished and results compiled, and comparing the amount of rough land there with adjacent counties surveyed, he believes we can add to this 2,321,000 acres more, making a total for the state of about 5,750,000 acres, almost one-sixth of its total area of thirty-six million acres. This area, whose outlines are almost identical with the limits of the yellow silt loam soil as mapped by soil experts, varies in the different counties from .18 to eighty per cent. and if cultivated is subject to serious and destructive erosion.

What is being done to keep this land which is potential forest soil permanently in timber? A few figures from some of the members of the Illinois Academy of Sciences who have been working on some of these counties for several years will help to answer the question. Dr. Pepoon of Chicago says that Jo Daviess county, credited with sixty-two and four-tenths per cent. of this class of land was originally a forest land. Now there is only about five per cent. of merchantable timber in solid blocks used mainly for posts and fuel, while about fifteen per cent. may be classed as heavily culled. In LaSalle county, according to Dr. George D. Fuller, of Chicago University, out of 35,220 acres examined only 6,530 acres, or two and three-tenths per cent. of the area covered by the survey is forested, this being in ravines or along the larger rivers.

In Cook County, according to Dr. Waterman, of Northwestern University, Department of Botany, out of 5,760 acres surveyed, only seven hundred acres still bear original forest growth and of this only eighty acres is virgin forest. The Cook County Forest Preserve Board, however, is doing much to save these scattered bits of native forest for the people of Cook County as a recreation ground and now has over 17,500 acres of such forest under its jurisdiction.

Forest Influences. Among the forest influences or forest reactions which should be considered in Illinois are the effects of the removal of the forest cover in causing irregularity of stream flow due to the drying up of streams and springs, with destructive floods. Dr. Fernow says that the stopping of floods is an engineering problem but that forests can be depended upon to render the flow of water throughout the year more uniform. Illustrations from remote regions lose their effect but we might take a specific one from Jo Daviess County. One flood in a stream only five miles long destroyed a stone mill dam and wrecked the large flouring mill. Some fifteen feet of silt was deposited on the bed of the mill pond after the flood had subsided, representing as Dr. Pepoon says, "one foot of eroded soil from four acres of farm land."

Another marked result of deforestation in this same county has been the drying up of springs and brooks and the lowering of the water table. This is quite in conformity with evidence cited by Greve, by McGee, Toumey and Mead. Where originally there were six minor brooks and fifteen springs in a certain map area, today none remain and the ground water has been lowered from eight to twelve feet below its former level. This is not the opinion of a casual visitor to the region but the observation of one who has studied the same region for years.

Erosion. It is stated on good authority that leaf mould will absorb from two to four times its weight in water. Due to this large absorptive capacity, measurements made in France show that surface run-off from wooded slopes is only one-half of that from deforested slopes. Reduction of run-off prevents erosion, so that one of the main remedies for badly eroded and gullied land, according to the Illinois Soil Survey, is "to put them back into forests as rapidly as possible." Their reports abound with instances of where soil abandonment is taking place, but more especially in the seven southern counties and in those adjoining the Wabash, Mississippi and Illinois rivers. The Illinois Geological Survey speaks of deforestation as one of the agencies in causing erosion, with the attendant evils of gullying and sheet washing.

Let us take some specific examples. Dr. Fuller says of LaSalle county, in the upper Illinois valley region, that "along many of the stream valleys are slopes of such a character that the removal of the forest cover will cause, and in some cases has already caused rather extensive gullying."

In Union county, where the Dongola topographic sheet is being prepared, many fields were seen, especially in yellow silt loam soil, where gullies were forming and the owners of the farms were making unsuccessful efforts to stop them with brush and straw. According to the older residents, these slopes had years ago been covered with a forest of tulip, white oak and red oak. Red oak and sycamore seedlings, along with sassafras

and inferior species, can now be found getting a foothold in some of them, showing that with a little assistance they might again become forested. In some fields seed had come in from the lower bottomland woods; in many cases it would be a question of planting.

Dr. Pepoon says that in Jo Daviess county cutting away the forests has resulted in erosion, "with all of its attendant evils." The Illinois Geological Survey in dealing with the Galena and Elizabeth Quadrangles, there says, under recommendations about erosion that if light pasturing and getting the land back into grass are not sufficient to stop the wash, rapidly growing trees, like the cottonwood and locust, can be planted, and the fields gradually brought back into timber land. Then later, by judicious cutting and replanting, the land may be made to yield a revenue from timber, instead of producing scantier and scantier crops until they become so small as to have no value.

Competent authority says that leaf-litter should not be grazed or burned over in order to have the maximum effect in preventing surface run-off, and this brings us to the subjects of grazing and fire protection. Suppose we take first the question of grazing and the problem of what may be called woodland pasture.

Grazing and the Woodland Pasture. Dr. George D. Fuller, of the University of Chicago Department of Botany, who has worked two summers in LaSalle county and knows thoroughly the character of the woods in that county, says that "grazing is so universally practiced that not over 5% of the oak and bottom land forests show reproduction in progress at the present time." From a strip estimate made in September of this year in a 100 acre woodland and pasture of the open park type, classed by Dr. Fuller as an "oak-hickory forest," we find as a consequence of grazing of cattle and hogs that there is less than one tree per acre of the three-inch diameter class of any species. Most of the trees are over 50 years of age, showing that there is no future crop of young trees coming on. The trees are very short boled, and while diameter growth was found to be rapid in these trees there are only 46 trees per acre and a stand of 1881 board feet per acre, so that the increment in volume on an acre would be very small.

In other forests of LaSalle county, where for some reason grazing had been lighter, we found the number of two and three inch trees had increased to 62 per acre, the total number of trees standing on an acre to 348, and the stand per acre to 4,625 board feet. While this disparity was in part due to differences in site, we can attribute a large part to the fact that trees of the smaller diameter classes had not been destroyed by grazing, but had grown up to healthy, middle-sized trees making up the bulk of the forest and offering some chance of financial profit to the owner.

In the ravines of some of these pastured forests in LaSalle county, where moisture conditions were better, there were more trees of the smaller diameter classes again and fermination conditions were so good and acorns so numerous on the ground that with a little care in excluding stock a good growth of young trees of red oak and other rapidly-growing species would have resulted.

Some of these poorly-stocked, struggling white oak forests on rather poor upland forest soils above Indian Creek had in less than 75 years produced the following crop per acre:

116—8-foot fence posts.
36—25-foot piling, with a top diameter of 6 inches.
212—7-foot mine props.
2042—5-foot mine props.

Counting the pasture worth from three to four dollars per acre, it is a question as to whether the land was not worth more for timber growing than it will be for pasture or farm land when cut off. Besides, it will be subject to severe gullying due to ravines which run through it, which will extend themselves farther back each year it lies as stump land.

Grazing—Jo Daviess County. This county is situated in the northwestern part of the State, and has escaped glaciation. Speaking of an ungrazed forest in Jo Daviess County, which from the enumeration of many rare herbaceous plants must be a paradise for the botanist, Dr. Pepoon, of Chicago, says: "A very striking feature of this woodland is the very large number of young oak, ash and hard maple, and to a lesser extent hickery, elm, basswood and ironwood trees, many of which have reached a height of 6 to 8 feet, and are evidently well started in a successful struggle to reach maturity. This shows better than any other fact the benefit to reproduction of keeping out cattle, sheep and hogs. From this we may say that any forest land in this area will be able to perpetuate itself if properly protected from grazing animals."

Wesley Bradfield, speaking of the northern Illinois river region, says, that the most important consideration is that forest land should be devoted solely to raising trees and should not be used as pasture land. "Forest land should have the advantage of an unbroken ground cover of leaf mulch, a soil which is not being constantly trampled by stock so that it will remain loose and porous and a solid stand of trees, whether of new seedlings or trees which are nearly mature and ready to harvest."

Dr. Waterman, in speaking of the tracts of forest in Cook county says that the worst things are picnicing and pasturage; while Dr. Vestal, speaking of Cumberland county, says pasturage is general and erosion has resulted in many places. This connection between pasturage and gullying of the land is mentioned by the Illinois Geological Survey, deforestation and grazing being discussed as two important factors in erosion of man's introduction. "The hoofs of cattle have cut the sod and over-grazing has killed the grass in places, so that the soil has been laid bare, to be washed by rains and blown by winds. These slopes in Fox valley might have been kept in a more productive state by more restricted grazing, or by letting them remain in timber."

Forest Taxation. Prof. Chapman will discuss the modern methods of taxation as applied to timberlands, so it is only necessary to mention the known facts about taxation of timber land in Illinois. From personal interviews with owners one learns that they are not cutting off the timber because taxation is excessive but through a desire to benefit the pasture, combined with ignorance of the true stumpage value of the timber and the desire to get rid of it quickly and easily. This they do by selling it for a lump sum to contractors dealing in mine props, posts and piling, who have no interest in the tract other than financial profit. This is largely a matter for education of the public after it has been found out what the

relative returns are from timber and farm crops on the same type of soil, taking into consideration the expense for getting each crop, at compound interest.

The main changes to be made would seem to be the adoption of more uniform methods of valuation for timber land by the county assessors. According to Wesley Bradfield, who investigated the methods of taxation in about 15 counties of the State in 1908, these methods very greatly among the following: Taking the value of the land for cultivation when cleared; assessing a certain per cent. of the value of timber on the land; taking the value of timber land as unimproved land only; value with reference to its location to easily accessible markets; the value of the land when used for pasture; and often simply an arbitrary determination of the fair cash value of the property by the assessor.

There is a provision for a bounty to be offered by the Board of County Commissioners to any person who shall plant one or more acres of land with forest trees and properly cultviate the same for three years. This bounty amounts to $10.00 per acre per annum for three years for each acre planted, trees not being spaced a greater distance than ten feet apart each way. Judging from the effect of bounty laws in other States, this law has had little effect in stimulating general planting.

Fire Protection. So far as we have ascertained, there are no state organizations for the protection of timber from fire in Illinois, except such as may come under the jurisdiction of county forest preserve boards. Fortunately, most of the timber is in small tracts, usually completely surrounded by roads, which greatly decreases the fire hazard.

According to data compiled from reports sent in to Dr. Forbes in 1915 by the several county crop reporters, some counties had no fires and those reported were most commonly caused by railroads, brush burning and campers. In Perry county it was mentioned that fall and early winter fires were started by coon hunters and in Union county we were told that it was a common occurrence in some parts for these men to burn over the woods at night to make travel through the woods easier for dogs. There have been a few cases of incendiarism reported but this is punishable under Section 18 of the Criminal Code with a fine of from $5.00 to $100.00 for wilfully starting brush or grass fires.

Railroads are made responsible for fires started by their engines and there is a law requiring them to keep their rights of way clear of weeds, grass and inflammable material.

Summarizing, we have shown that almost six million acres of land in Illinois, on account of topography and soil, are better fitted for growing timber than for any other purpose; that our stands of virgin timber are disappearing rapidly through cutting or are being replaced by those of poor growth capacity through grazing and occasional fires; that this removal of the forests, as evidenced by reliable investigators in several counties and as shown by the reports of the Illinois Soil Survey and Illinois Geological Survey, is bringing about the usual results—disastrous floods, the drying up of springs and brooks and the lowering of the level of the ground water; that by the gullying of the lighter soils due to the removal of the forest cover by unwise cutting and the pasturing of stock, much land is

being rendered unfit for agriculture and offers a chance for reforestation; and that minor changes may be necessary in methods of valuation of timberlands and in fire protection.

The question remains, then, as to what steps the State should take, in the interests of her citizens, not only to assume her share of responsibility in the national program for increasing the available timber supply of the country but to safeguard those remnants of the original forest which not only contributed largely to the development of the State and her industries, but by whose destruction the balance of Nature's forces have been seriously disturbed.

Just as we will owe this conference a debt of gratitude for presenting these facts to the public in a new light, so we look to it for valuable assistance in working out a solution of this vital economic question. (Applause)

MR. WOOLLEN: I now introduce the forester of Indiana, Mr. Charles C. Deam. (Applause)

MR. CHARLES C. DEAM: Mr. Chairman, ladies and gentlemen, the subject of my paper is "Forest Conditions in Indiana."

The area of Indiana is 22,403,502 acres. Practically the whole of the State was formerly covered with one of the best hardwood forests of the world. The wooded area has steadily decreased since active settlement began about one hundred years ago. In 1880 the forest area has dwindled down to 4,355,191 acres of first-class timberland. In 1917 the timberland area of Indiana is given as 1,664,047 acres, or about seven per cent. of the whole area. Virgin forests have become so scarce that only a few isolated tracts remain. Turkey Run State Park, the largest of these, containing less than three hundred acres, was recently purchased by some patriotic citizens, and turned over to the State as a relic of the grandeur and wealth of Indiana's primeval forests.

In 1910 statistics rank Indiana third in the amount and value of its improved land, exceeded only by Iowa and Illinois. These statistics show that Indiana is essentially an agricultural State, and that it will always remain so, is implied by its geographical location. The geographical situation of Indiana favors agriculture, including both grazing and horticulture. It is traversed by trunk line railroads in all directions with nearby terminals such as Chicago, with an estimated population of over three millions; Milwaukee with 504,707; Detroit and Cleveland with 936,000 each and Cincinnati with 472,668. Indiana is the nearest source of supply to the cities enumerated, for certain agricultural and horticultural products. It also serves many smaller cities such as Louisville and others that could be named.

The surface of the greater part of Indiana is level and is contained in the glaciated region. This area has great agricultural possibilities, about ninety-five per cent. of it being already well improved. It is predicted that the forests of this area will gradually disappear and that the only forest tree growth will be in the form of windbreaks. There are, however, about twenty-three counties in the southern part of the State that have a rough topography. This area is a series of hills and fertile valleys of varying width and length. The hills vary in height from one

hundred to two hundred feet. The slopes also vary from gentle to precipitous. The greater part of the slopes are gentle to steep. The soil of the greater part of the area is limestone and will support a good stand of blue grass. Parts of about ten counties have a residual soil composed of decomposed sandstone, knobstone or knobstone shale which will not support a good stand of blue grass, and which are regarded as our poorest agricultural and forestal lands. This hill area may be roughly divided into forestal and agricultural lands. There is, however, a wide divergance of opinion as to the definition of each in Indiana. The forester tells us that all lands that will not support a permanent and profitable agriculture should be classed as forest land. He calls attention to areas that have already been cleared and farmed successfully for a few years, but having become washed and eroded, have been abandoned. He says: "Such lands should not have been cleared." The Agricultural Experimental Station expert tells us that the washing and erosion is the result of poor farming, and that practically any slope in Indiana might be cleared and farmed or grazed successfully. The land owner will tell you he can clear a rugged slope and grow tobacco on it a year or two and receive an income from five to one hundred times the value of the land, but he fails to tell you that after a few years the soil on their farmed slopes will be washed away. We should, therefore, not be surprised to find thousands of acres of hill land that have been farmed for a year or two and then abandoned, or left to "go to pasture or grow up" to use the vernacular of the hill country.

Today there are thousands of acres of cleared land in the southern part of the State which are not now farmed because they have washed or eroded so that they cannot be farmed or are too unprofitable to be farmed. They are growing up in poverty grass, weeds, briars, sassafras, persimmon, etc. These washed areas usually occur in small tracts of a few acres in extent. Yet the agricultural expert tells us all of these areas can be redeemed and be made profitable for agriculture and grazing.

Is this hill country forestal or agricultural lands? Let us consult statistics and also note the activities of the present population. In 1915 ninety-two per cent. of Indiana was listed as farm land. Of twenty of the hilliest counties of the State, eleven reported more than ninety-two per cent. of their county as farm land. In 1917 the average sized farm in Indiana was one hundred three acres, yet in eleven of the roughest counties of the State, the average farm contained only ninety-six acres. The average rural population in Indiana in 1916 was forty-three per square mile. Yet Crawford, Orange and Perry counties which are regarded as among the roughest counties of the State had an average of forty. The average forty-three for the State represents an inflated figure, since the large rural coal mine and suburban populations are included in the State average. It is reasonable to believe that agriculture today in the counties just named is supporting as large and contented a population as the average county.

It is a fact that the forests are disappearing most rapidly in the hilliest counties. Why is this? The following may be offered in answer. The land owner has no notion of the annual increment value of an acre of

forest land. The writer has asked scores of land owners at what they estimated the value of the growth of an acre of woodland, and not one has had the knowledge or even the courage to venture an answer. He does not know the potential value of a forest, but he does know that a forest crop is a long time investment, and that his economic conditions demand an investment of short duration. The hilly or forestal land of Indiana is surrounded by abundant coal fields, and the slash of a forest crop has little or no commercial value. In most instances after all of the merchantable timber has been removed, the slash would not pay for clearing of the land. Coal can be bought for what it costs to cut wood and many farmers who have wood rotting in their forest, take produce to market and return with a load of coal. The time required to cut wood can be spent at more remunerative employment or the bitter winter days of wood cutting can be turned into a rabbit hunt. In the hilly counties there is no outlet for surplus labor such as in the northern counties. In the north, witness each morning the thousands of laborers, especially girls, on the interurban cars going to the cities to work. As a consequence the farmer of the hill country is compelled to use the surplus man-power on his farm, which in the aggregate is eight per cent. smaller than the farm of the north. To do this, he sets to clearing more land, and grows tobacco, which requires about ten times more man-power to grow than corn. Or, he will grow tomatoes, strawberries or other bush fruits or vegetables. As an example of this form of intensive agriculture may be cited the growing of strawberries on the "knobs" in the vicinity of Borden where as high as five car loads have been shipped in one day. The greatest inroad on our forest area has been made by the recent development of the dairy business. The introduction and wide use of the silo; our recent knowledge of certain forage plants, such as alfalfa; and our greater facilities for marketing milk and cream, such as improved roads, auto trucks, etc., have been extremely favorable to the development of the dairy business. The high price of food products has advanced the price of butter fat to the point where the hill farmer will tell you that the income from his cows is equal to that of his farm. In order to get more grazing land, every available nook and corner and forest land is taken, and the remaining forest land is being fenced. It is now rare to see open forest land, or a fenced forest that is not pastured. It is a well known fact that pasturage will stop all reproduction in a hardwood forest, and if there is not a change in the management of the forest area in the hill country, there will be no forests after the maturity of the present crop.

The fire hazard in Indiana is not a serious barrier to maintaining our forest area. Forests are usually open, small and separated by numerous public roads. In any event fire would not burn over any great area if any organized effort was made to stop it. As a rule, owners do not care if their forests are burned over, in fact many burn their forests over each year to keep reproduction down, and to burn up the leaves so the grass will get a start. When a fire is started in a forest there is little effort made to stop it except when it threatens a fence, haystack or buildings.

Our present tax system is an important factor in encouraging land

owners to clear land. There is a widespread belief that forests should be exempt from taxation, basing the claim on the communal benefit of the forest.

To summarize:

Indiana is essentially an agricultural State.

It is divided into small farms, averaging one hundred three acres, all of which are in the hands of private ownership.

An average of ninety-two per cent. of all these farms is improved, leaving less than ninety-one acres of forest land to each farm.

The economic conditions confronting the owners; the high price of farm products and nearness to the markets which make farm land worth more than forest land; and the ignorance of the owner of forest management, combine to cause the neglect of the practice of forestry in Indiana.

I have interviewed many land owners and all agree that something should be done to provide a future supply of timber for Indiana. They claim that they cannot afford to practice forestry on their small holdings under the present economic conditions, and that the State should own the forest land.

Since the condition of the public mind is in favor of State owned forests, I would recommend that the State at once purchase a sufficient area to provide for the future supply of timber, and that the same be paid for by a bond issue to mature in from fifty to one hundred years. (Applause)

Some announcements were made by the Secretary.

ADJOURNMENT.

WEDNESDAY AFTERNOON SESSION.

The meeting was called to order at 2:00 p. m., with Dr. F. W. Shepardson presiding.

THE CHAIRMAN: The convention will please come to order. The gentleman who presided this morning has been obliged to fill another engagement and the committee in charge has asked me to assume the chair this afternoon. I am going to ask Mr. Sauers to read us a letter that he received from Mr. B. A. Johnson.

MR. CHARLES G. SAUERS: (Reading letter)

"When Charles G. Sauers, writing for Richard Lieber, Director of Conservation of the State of Indiana, addressed me a letter on September 28th, he expressed himself in the last paragraph of his communication in a heartfelt and direct manner which has led me to believe that he meant it, and which furnished me a text for the shortest possible communication that I can write you on this subject.

"Mr. Sauers said: 'Will you address this conference upon the subject of Co-operation Between the Lumberman and the Forester?' We realize that it is possibly a rather delicate subject but know that you have the situation well in mind and believe that you can handle it to the best advantage. Will you make this address and will you also arrange your plans to be at the conference throughout the two days? Questions will be constantly coming up which you will be best able to answer and your presence will be of great aid. We cannot take no for an answer because you are needed.'

"I do not consider that this matter of a discussion of the relations between the lumberman and the forester is a delicate subject. I am much of the opinion that there has been altogether too much diplomacy and preservation of ethics, and altogether too much of an endeavor upon the part of both sides of this discussion to handle the subject with wool lined and heavy gloves—rather than going at the matter with hammer and saw and ax.

"We have all hedged about this affair with an altogether too nice, and lady-like an attitude to get very far with such a subject.

"The forester, being a man of the schools cleverly and fully educated, desiring more to see his formulas worked out and his ethics paramount than could be described by 'money in the till' as measuring the result of work well done, being a man of a profession which never contemplated the amassing of money as denoting success in life, has failed to recognize the very opposite attributes of the lumberman. Of course this is not true of all foresters and neither does it matter whether it is true or not, providing the forester has deported himself in such a surface way as to carry a conviction of this attitude to the mind of the lumberman.

"I maintain that this is the basic cause for the lumberman's opposition to the forester, whether the forester has been able to see the condition or not. The forester is highly specialized in his grasp of forestry and all it means to him, but he is not highly specialized and has a very extremely marked lack of information as to the effect his attitude naturally must have upon the lumberman.

"This statement of mine is carefully thought out and deliberately made with no desire to be 'delicate' and with only a desire to 'know the truth' because the Bible says 'the truth shall set ye free'; and the query I want to make is, 'do we not wish above all things, freedom?'

"In any reference I make to lumbermen and their attitude toward foresters, I do not refer to lumbermen as a class, but to the majority of lumbermen, to the very large and overwhelming majority of lumbermen, for there are many lumbermen, of course, who have butted their way through football wedges and conscientiously worked their way through university courses, whether approaching them from the necessity of doing janitor work to pay for their matriculation or from the 'Gold Coast' of some opulent eastern university, riding to their class rooms in foreign-born runabouts.

"Now the majority of lumbermen do not lumber out of books, and have a clean cut inherited opinion of the rights of property as set down in the constitution of the United States. His trees belong to him to have and to hold and to cut as he pleases. While it is altogether probable that the great public has something to say about all this thing of 'a national timberland policy for the United States' the majority of lumbermen have not considered the great public as having anything to do with their business any more than they have an interest in the great public's business and very naturally, resent anybody telling them what they shall do with their trees quite as much as any man would resent public interference with the amount of money he should use for his personal pleasure or what style of car he should drive or where he should bank his money or what type of woman he should choose for his wife.

"Up to within a very few years, and even up to within a very few months, the majority of the lumbermen of the land have not known or cared much or believed much concerning the possible will of the people, as discussed in soviet and Bolshevik proganda, either academically or in fact.

"The great majority of lumbermen have not very seriously considered that the base of their property is something emanating from the public domain and that theirs is a so-called 'wasting industry.'

"The majority of the lumbermen of the United States realize that they are misunderstood and brow beaten by the public press, by bureaucratic Washington, by government and by public opinion, and they resent it and they have never yet been able to organize a machine to fight it and they never will.

"I could name one hundred fifty lumbermen, giving their initials and home addresses, without misspelling a name or giving a wrong location where those lumbermen might be found ordinarily, which list when it had been compiled, would contain the names and addresses of practically all of the high class lumbermen in the United States who had ever made a call of courtesy or one of business in a voluntary way on the Forest Service in Washington, or who had any knowledge or any care for the wonderful institution that the Forest Service is, as it is now housed and now functions in the Atlantic Building in our national Capitol.

"Lumbermen generally, that is the majority of lumbermen, know a great deal more about the Forest Products Laboratory at Madison than they do about the Forest Service at Washington, but they have no real patience with scientific affairs as a whole. They are not interested in effciency diagram, or especially in statistics, but are deeply and particularly interested in the advancement in public favor of the particular wood which is in the till at the end of the year.

"This attitude does not under any circumstances establish the fact that the lumberman is ignorant, far from it. He is like Barney Fagan's 'high born lady'—born that way.

"Yes, I know the above statement needs explanation for it is a statement and not an argument, a statement of facts, a hurdle set up in your way, all ye organizers wherever ye are dispersed.

"God never made any two trees alike and he made many species of trees—all the varieties of fir and hemlock, pine and hardwoods, each with its special attribute and never any common denominator of value, but the false and fiated denominator of the 'so much per thousand feet'; and there never was any one thousand foot pile of lumber which had the same exact value of any other one thousand foot pile of lumber, even if it all came out of the same tree and same log and all was cut to one particular dimension; and therein are the differences that beset any man who endeavors to make the lumbermen of the United States all of a similar opinion upon any subject.

"Manufacturing methods differ in great measure with each species of wood manufactured and one locality with another. For this reason there is no nationally or internationally known unit of value in lumber.

"A pig of iron is a pig of iron at Gary, at Hongkong, on the Thames

embankment, or in the Gogebic range. A bushel of wheat, with but little difference in grade, is comparable with all other bushels of wheat, whether situated in North Dakota or by the edge of the Black Sea, but one thousand feet of lumber is not like any other one thousand feet of lumber that ever has been or will be, when it comes to giving it a value, and therein is the reason why there are so many manufacturers' associations in the lumber trade, and why those manufacturers' associations have up to date paid vastly more attention to making the lumber consuming world conscious of the fact that their lumber is better than any other lumber, and have paid so little attention to what any government bureau or any scientific man in the bureau, or out of it, may consider to be the proper treatment of his raw product, whether it be in the pile or in the forest.

"The analytical forest service man and independent forester and scientific lumberman will get a fundamental truth out of these words without boiling them even to a fever heat, or into an epigram, and yet this is not pessimism, this is only the truth, and I wish you would all try and make the most of it. For, along the lines of truth are the gateways to co-operation, co-ordination, solidarity, and upon no other basis can you figure out a practical national lumber policy for the United States, and you never will figure out such a policy until you learn to jump all these hurdles without tripping.

"How will you do this thing? Keep your associations of all lumbermen, of all classes, going at even speed ahead. Try and believe that you are all in the same boat, under orders for the same port, and don't rock it. Keep up an everlasting discussion of this subject and bring constructive suggestions to the forum of the Lumber World Review or to any other forum, where free speech and honest thought is tolerated 'in this land of the free and home of the brave' and remember that the student who lives in an apartment and likes it has as much right to an opinion as the man who has several million dollars in the bank; and probably, sometimes, you will reach a conclusion, but it will not any of it be done that will be worth while unless the rights of all concerned are considered.

"Bolling Arthur Johnson,
"Editor and Publisher,
"Lumber World Review."

The Chairman appointed the following as the Resolutions Committee:

Richard Lieber, Chairman, Indianapolis
E. M. Stotlar, Illinois
Findlay Torrence, Ohio
Dr. F. W. Shepardson, Illinois
W. A. Snyder, Ohio
J. G. Peters, Washington
C. H. Kramer, Indiana
P. S. Ridsale, Washington

THE CHAIRMAN: This morning our thoughts were turned toward the forest situation in these three states. You must have noted with a

marked degree of interest as each man presented a paper looking at the situation from a different angle and each gave us something well worth our consideration and careful thought.

This afternoon we are to turn away for a while from state lines to consider the subject from a national point of view. Our general subject is "National Forestry Policy". The first speaker is known the country over because of his work in the field. I want to introduce to you Lieutenant-Colonel Henry S. Graves, Forester of the United States, who will talk upon the forestry situation. (Applause)

LT.-COL. HENRY S. GRAVES: Ladies and gentlemen, the forest situation is of peculiar interest to Indiana, Illinois, and Ohio. All three states have a pressing problem in the production of home grown forests. They are also vitally concerned in the forest situation in other parts of the country, for they are large consumers of lumber and other wood products and already the greater part of what they use is brought in from other states.

At this time public attention is focused on the forest question as never before. This is due partly to the lessons of the war, which have emphasizd the national importance of all of our natural resources; it is due also to the very high prices of lumber and of articles manufactured from wood, to difficulties in obtaining certain raw products in adequate quantities, and to local consequences of forest destruction that are making themselves felt in an increasing degree.

This conference is very significant, for it represents, to my mind, an inquiry on the part of the public as to how our forests are being handled—whether they are being safeguarded and perpetuated, and if not, what constructive plans are in contemplation to meet the situation.

The Service of Forest. Forests render an indispensable service in three ways:

(a) In the production of materials for construction and for the manufacture of a multitude of articles essential in the industries and in our every-day life.

(b) In the utilization of land that would otherwise be idle, thus making possible the maintenance of local industries and the building up of communities.

(c) In the protection of mountain slopes, the conservation of sources of water, and the provision of other general public benefits.

The central states are interested in forests and forestry in all three of these aspects. In some ways the problems of forestry are more pressing in this region than in some other sections, and if the citizens of these states wish their various industrial needs to be met, it is essential that they interest themselves in our forest problems in both their local and national phases.

Conditions in the Central States. Illinois, Indiana, and Ohio, together with the neighboring portions of Michigan and Wisconsin, constitute the most important center of wood manufacturing industries in the country, that is the industries making vehicles, furniture, railway cars, tools, planing-mill products, and the like. About one-third of the total capital invested and about one-third of the wage earners in the wood-

manufacturing industries of the country are in this section. And the lumber consumed amounts to five and one-half billion feet a year, or about a quarter of the aggregate used in this country for such enterprises.

Of the approximately three and one-third billion feet of material that goes into the wood-using manufactures of Illinois, Indiana and Ohio alone, nearly one and one-half billion feet are in the form of hardwoods native to and formerly abundant in these states. In fact, it was the large supply of superior oak, hickory, maple, ash, yellow poplar, and walnut that led to the establishment of many of the wood manufactures in the early days.

Twenty years ago Indiana led all the states in the quantity of hardwood lumber cut. At that time the state produced more lumber than it used. Since then the forests have been rapidly cut away to supply the industries and to make way for agriculture, so that the annual cut is now only about a quarter of what it was then.

About half of the wood material now used by the Indiana industries comes from species native to the State, but about two-thirds of this hardwood material is imported from other states. As long ago as 1911 only about twenty per cent of the walnut used in Indiana came from its own forests, about a quarter of the yellow poplar and hickory, a third of the basswood, forty per cent of the hard maple and forty-three per cent of the oak. The showing today would be still more unfavorable.

In Illinois the wood-using industries use about one and three-fourths billion feet of lumber, of which about one-third is hardwood of species native to the State. The industries, however, have to import over ninety per cent. of this hardwood material. Ohio is somewhat better off than Illinois, being able to produce about a quarter of the hardwoods used in her wood manufacturing industries.

Dependence on Other States. The situation in hardwoods, however, constitutes only one phase of the problem. These states within the hardwood belt of the country and their production of softwoods is and always was relatively small. For general construction lumber they must look to other sources of supply. And here we have a demand not only from the wood manufacturing industries, but also from all other consumers who use lumber for various general purposes, including the great number of shippers who need material for boxes, crates, and other containers.

Among the consumers of lumber, too, are representatives of the greatest wood consuming group in the country—the farmers. Though the farms in the central states have better and more adequate buildings than those in many other regions, nevertheless the needs for building material, now and in the future, of the farmers in Indiana, Illinois and Ohio must be borne in mind in considering either a local or a national policy of forestry.

These facts raise two very important questions: First, what can these states do in the way of production of wood by growth; and, second, what is the situation in the rest of the country regarding forest supplies?

Today the home product does not nearly meet the annual requirements, and the cutting that is done far exceeds what is grown each year. It is probable, from the best estimates that I have been able to secure, that the annual growth of material of potential value in the three states is

not over one-quarter of what is cut each year. This means that the forests are progressively losing ground with considerable rapidity.

This deficit is due only in part to the clearing of land for agriculture. It is due also to the failure to handle the lands in a way to secure good reproduction and properly to protect the young trees that become established. With better care and management the forest lands of these states should yield from two to three times the present growth, and this would, I believe, be possible without checking the extension of cultivation over lands suited to that purpose.

These central states should not, however, consider that their responsibility ceases with promoting the production of home grown timber. Even with that production, it will be necessary to look to other sources for a large part of the annual requirements of the industries, of the farmers, and of other consumers. If these states complacently expect that there will be an indefinite supply in the general market of the kind of material they have been securing, they will be gravely disillusioned, unless the present methods of handling forests are changed. They may not be able to act directly in altering conditions outside their own boundaries. Where interstate interests are involved the nation itself must take the leadership and direction. Individual states may, however, express their demand for the protection of their industrial interests and support the government in the necessary action to secure it.

The National Problem. We have throughout our history drawn chiefly upon the original forest growth for the bulk of the material used in the industries. Though in certain localities we are now beginning to use second growth for certain purposes, most of the lumber in the general market comes from so-called original growth, that is, from trees one hundred and fifty to two hundred and fifty years old. As one region has been exhausted railroads have been extended into new centers and material in abundance has been furnished the general market. After the softwoods of the northeast and the lake states were largely cut, we looked to the southern pine forests, and the country felt secure in the knowledge that there are still large quantities of timber on the Pacific Coast. Many economists still think in terms of our original supplies, largely ignoring the high prices that result from the transport of material for two or three thousand miles, ignoring the consequences of the withdrawal of competition from the older and more accessible sources of supplies, ignoring the effect on communities of exhausting the resource that has constituted the chief basis of their industrial prosperity. All these, and other matters too, must be included in considering the economic problems of forests and forestry.

The lumber industry has been built up to exploit old growth timber. The belief that there is a plentiful supply left somewhere further on has made the country complacent, and the result is that our forests have been cut without reference to restocking with new growth. The interest in protection has been chiefly centered on the old growth timber. Little progress has been made in restoring to productiveness lands laid waste by destructive lumbering and fire.

The consequence is that most of the eastern states are in a position

analogous to Indiana, Ohio, and Illinois. They are drawing upon other states for a large part of their requirements, the amount cut each year is two to three times what is produced by growth in the home forests, and there is an increasing area of wasted lands unfit for cultivation and that might be producing forests. Prices are very high, partly because of the same factors that influence the price of other commodities, partly because the lumber is brought from greater distances or from less accessible areas that require expensive logging operations.

Difficulties are already being encountered in securing raw material of the character and in the quantity desired. Many of our newsprint paper mills of the east find increasing embarrassment for pulp wood within reasonable shipping distance. Some concerns will probably have to close, or move to the west.

The Hardwood Situation. Perhaps the most serious situation exists in the matter of hardwood supplies. In the case of softwoods there is a much greater reserve supply left than with hardwoods. Moreover, one species of softwood may be more readily substituted for another previously used, than in the case of hardwoods.

The quantities of original hardwood growth in the Appalachians, the Ozarks, and southern valleys are less than popularly supposed. Most of the bodies of timber suited to major lumber operations are already placed, and the majority of operators say that they have not more than ten to fifteen years' supply ahead. Estimates of the available supplies of old timber show that most of our better grades of first growth poplar, basswood ash, and walnut will last but fifteen to twenty years, and of oak but little longer.

This in itself would not be alarming if there were a crop of younger growth coming on. We find that our old reserve of virgin hardwoods is being rapidly depleted. This is inevitable. But unfortunately it is not being replaced in any adequate degree. Not only is there almost no effort to secure a replacement, but fires still burn over the lands, destroying what nature may establish and preventing natural seeding.

The hardwood industries must look in the future to two sources of supply: The mountain regions, such as the Appalachians and Ozarks, where there are large areas of land suited only to tree growth, and to the smaller tracts of land unsuited to cultivation within the farming country. We are failing to secure adequate forest replacement and growth in both these natural sources of future supply.

Our hardwood forests are progressively deteriorating. Some sort of vegetation follows cutting as a rule in the hardwood region, but it is very commonly of poor species, scanty, and of poor form, having but little potential value.

Other countries are looking to the United States for hardwoods. Russia, Finland, and Scandinavia may largely supply the deficit of western Europe for softwoods, but there will be a constant demand by Europe for our hardwoods if we have the supply. We are not today producing by growth enough to meet our own future needs for hardwoods, let alone the needs of other countries.

The General Situation. In the main the problem of a supply of soft-

wood lumber is less serious than of hardwoods, because there is a much greater reserve supply of old timber. The coniferous forests are not, however, being handled materially better than the hardwoods, and the damage by fire is much greater. We have not yet mastered the fires. The coniferous forests are in the main cut without reference to their perpetuation, and the replacement and growth that does occur is far below what is used and destroyed and only a small part of what the country will need in the future.

The most serious situation in regard to softwoods is that the old centers of supply are being rapidly exhausted without adequate replacement and our country must depend on material brought from great distances. The southern pine which has been a dominating factor in the market for a number of years is already yielding to Pacific Coast lumber in many places. This tendency will increase, for most of the old growth yellow pine will be cut within fifteen to twenty years. This means that the country is paying a constantly increasing freight bill for its lumber. I don't know what freight bill Indiana pays. I think New York pays over six million dollars a year.

It is not sound national economy for a country of our size to have to draw its lumber supplies from one section. The Atlantic States should not be required to obtain their lumber from three thousand miles away, with the high prices necessitated by the long transport. There should be producing forests well distributed throughout the country. It is of interest to the central states to have producing forests in Minnesota and in the south. With the rapid depletion of these older centers and the failure to replace them, the burdens upon the farmers and other consumers in the central states and the east will increase each year.

Many have urged that we are using more lumber than is really necessary. It is urged that we can reduce our consumption of lumber and use other materials. We might become a cement using nation like the Mediterranean countries. We learned to do without a good many things in the war. But that does not signify that it would react to our public welfare to do so in peace times. Our consumption will decline if lumber becomes so high priced as to be out of reach of the ordinary buyer. If it is available, however, our total consumption will not decline; it will, in my opinion, rise in the future.

Europe is often cited as requiring a constantly smaller quantity of lumber. In England the total consumption of lumber from 1851 to 1911 increased five-fold. Its per capita consumption was in 1911 three times what it had been sixty years before.

It is not necessary for us to become a cement using nation. It is not necessary for us to close our wood using plants. It is not necessary for the farmers and other consumers to use other materials when they prefer wood as a better and more convenient material for many purposes. It is not necessary for our nation to be deprived of a material that in the war proved to be an absolute necessity for a multitude of uses. For we have enough land for forest production that is of little or no value for anything else, and will not be used for anything else. Some have estimated that we have fifty to one hundred million acres of such lands that already

have been reduced to waste and today lie idle and unproductive. I am speaking, of course, of conditions where the bulk of the land, or a considerable part of it, is porous and suited only to the growing of forests. We can meet our forest needs if only we will stop the destructive processes that are now in vogue and employ wholly practical methods to secure forest renewal.

Forestry the Solution. The solution of our forestry problem consists in stopping the destruction by fire and other agencies, in using methods that make possible natural reproduction after logging, and in the restocking by tree growth of lands that have been made economic wastes. The fear has been expressed by some that such an objective would conflict with the expansion of agriculture and stock raising. Exactly the contrary would be the result. No sane program of forestry would propose the use of lands for forestry that are better adapted to agriculture and settlement. Forestry, agriculture, and stock raising go hand in hand. They are complementary. It is possible to point to numerous circumstances and cases where destructive handling of forests retards agricultural development. We can show in the same way how the right handling of forests with protection and replacement is a factor, and often the principal factor, in building up agriculture that otherwise would follow very slowly or be indefinitely held back.

Public Aspects of Forestry. The problem of forestry has both a national and a local aspect. The nation is concerned in the country-wide securing and distributing of raw materials for the varying needs of different regions, and in the protective service of forests on interstate rivers. The states and localities are interested in the support of local industries, in local protective benefits of forests, and in having lands productive and a basis for support of the communities.

We have today something like one hundred and sixty million acres of public forests. These should be, I believe, practically doubled. We have been carrying on a moderate program of purchases, having acquired in the last two years two million acres in the east. The public benefits of productive forests justify the participation of the public in working out the problem. The character of the problem is such as to make public participation absolutely necessary. It is one in which the nation, the states, the communities, and private owners must each play an important part.

The emphasis in recent years on public forests has given the impression that our forest question was being solved. Our National Forests are rendering a great public benefit. They are under protection and their resources are being used in a way to insure their perpetuation and continued service to the communities and the nation. Their timber already provides a large part of the local demand in a number of the western states and will increasingly be used for general needs of the country. But they are not extensive enough nor well enough distributed to meet more than part of the country's needs for forests. At present the timber cut from them constitutes about three per cent of the entire lumber consumption of the country. The rest comes from private lands. As the private timber of the west becomes exhausted they will be of increasing importance

as a reserve for the general market. It is obvious that even with a greatly extended program of acquisition of public forests we must still look to private forests, exactly as other countries do, for a part of our future forest supplies.

The problem of forestry requires action both by the public and by private owners. I would emphasize especially the production of old growth lumber of special quality. The public should assume a much larger share of the burden of forestry than it does today, both in acquiring and managing larger areas of publicly owned forests and in aiding private owners to protect their lands and to secure forest replacement.

Responsibility of Private Owners. The entire burden of forestry should not, however, be assumed by the public. Private proprietorship of land carries with it certain definite responsibilities that owners can not escape. They have the duty of handling their lands in such a way as not to injure others or the general public. The turning of forest lands into a waste as is now being done on a very extensive scale is a very great injury to the public. These destructive practices can be condoned only on the ground that the public has complacently permitted them and has not furnished the aid and direction that are needed in getting constructive measures of a practical character into actual practice.

The character of the problem of forestry is such that the private owner unaided has great difficulty even in securing adequate protection, let alone the renewal after cutting. The public must, therefore, share the responsibility for the present situation that has resulted from destructive methods. If, however, the public does its part, it may require owners to handle their lands in such a way that an unproductive waste will not follow in the wake of their operations.

Need of a National Policy. The situation clearly calls for the adoption of a broad and far-reaching policy for the nation; a policy in which objectives are clearly defined, the responsibilities of the public and of private land owners are recognized, the activities of both the public and private owners brought into correlation, and a practical legislative and administrative program outlined.

On various occasions during the last eight months I have set forth what I believe to be the principles that should underlie such a policy. Time does not permit on this occasion a discussion of all its details, but a brief outline will indicate its chief features.

A National Policy Outlined. (1) *Public Forests.* A national policy of forestry should provide first of all for an extensive program of publicity owned forests, owned in part by the federal government, in part by the states, and in part by municipalities, and by quasi-public institutions and organizations. At the present time the public owns about twenty-five per cent of the country's forests. This should be extended to fully forty or fifty per cent.

The federal holdings should be extended by purchase, by exchange of stumpage for cut-over lands, by additions to the National Forests of land now in the unreserved public domain. It should be the aim to include areas needed for the protection of watersheds, for the prevention of erosion for recreation and other general public purposes. Cut-over

lands should be acquired for the additional purpose of future production of lumber and other products, and of establishing demonstration areas and centers of federal co-operation with states and private owners. These federal forests should be distributed in all forest regions of the country.

The states should establish public forests with the same general objectives as the federal forests and with special reference to the local economic and industrial needs. Several of our states have already outlined a definite program of acquisition toward which they are working as fast as money can be supplied. Thus the officers of Pennsylvania, which already own over one million acres, have a program for acquiring over four million acres more. New York has an ambitious program and is adding to her forests rapidly. Massachusetts is endeavoring to secure some two hundred and fifty thousand acres, and other states are making progress along the same line. Indiana has made an excellent beginning. It is hoped that it will be possible to secure the dunes for a great recreation park, and I hope that the movement also may extend to acquiring larger public areas within the other forest regions of the State. The establishment of well located state forests in Illinois and Ohio would greatly stimulate the interest in forestry and aid in securing better handling of private woods.

Every encouragement should also be given to municipalities to acquire public forests and woodland parks. The municipality or community forest is a great factor in European countries. Their benefit has been conspicuously demonstrated. Many cities and towns in this country already have public woodlnads. The movement should be greatly extended.

Private Forests. The safeguarding and perpetuation of forests on private lands are possible through an organized system of fire protection, through the prohibition of destructive processes that produce waste lands, and through the promotion of constructive and entirely practical measures of forestry. The participation, liberal co-operation and direction of the public in working out the problems involved is essential to success.

Fire Protection. Effective fire protection is achieved only through a joint undertaking between public and private agencies in which all lands, regardless of ownership, are brought under an organized system. Necessarily conditions in different states vary widely. In these central states the requirements are quite different from those in Minnesota, Oregon, Maine, or Louisiana.

In general there should be incorporated in the forest laws of the State requirements to bring all forest owners into the protective system, and to extend it to all cut-over and unimproved lands in the State not needed for agriculture, together with the disposal, by lopping or burning, of dangerous slashings and other special measures that the local conditions may require.

There should be provided by the State the administrative machinery necessary to carry out the work effectively.

The public should share in the burden of protection. The division of cost will necessarily vary in different states, as is now the case among those states which have inaugurated such a system. The public may properly bear the cost of the State-wide patrol system, including

overhead, inspection, look-outs, and similar items, and a portion of the fire suppression costs.

In general, the cost of the preventive system should be shared about equally between the public and the owner of the land. At the present time assistance by the states and the efforts of the private owners alike are inadequate. Measures like brush disposal are essentially a part of the logging operation and should be a charge against it.

The Federal Government should grant liberal aid in fire protection, far greater than at present. Its aid should be contingent on the State's inaugurating and carrying out such a system as above described. This financial help should not exceed in amount that appropriated by the State.

I think that the Federal Government should grant a much larger co-operation than they have heretofore. We have been distributing about one hundred thousand dollars to meet the conditions of the Federal law. This, of course, is very small. We have a national problem and I believe that the national government should provide liberally to aid the states, making the aid contingent on acts by the states.

Protection Against Insects and Diseases. As in fire protection, the spread of dangerous insect infestations and diseases requires the aid and direction of the public. Both the national and State governments should participate and appropriate liberally to check the depredations.

Forest Renewal. The renewal of forests on lands not required for agriculture and settlement is an essential feature of a national policy of forestry and an effective program should be worked out in each state, backed by appropriate legislation and efficient administration, which will achieve this object on private as well as on public property. As in the case of fire protection, forest renewal on private lands require the participation and aid of the public.

There are two problems of forest renewal: First, the restocking of lands already cut over and now in a condition of waste; and, second, providing for natural reproduction as the timber is cut.

Probably the only way to secure a restocking of cut-over waste lands is for them to be replanted. Michigan is pursuing the policy of replanting, and a number of other states are beginning to follow that example. Where there are still seed-bearing trees on cut-over lands, or seed in the ground, continued fire protection may often suffice for restocking. Where there is no chance for natural reproduction, planting or sowing will be necessary. The public will have to take over a large portion of the cut-over lands and restore them to productivity. In many cases, however, owners may be induced to restock their waste lands as a business undertaking.

Provision for forest renewal should be made at the time of cutting. Sufficient restocking of the average private tract can be secured by natural measures. On certain types of forests, forest renewal will result from fire protection alone. In many instances, however, where exploitation is unrestricted fire protection alone does not suffice to secure renewal and to prevent the lands becoming waste.

If protection alone does not suffice to secure forest reproduction, the owners should be required to adopt such additional measures as may be necessary to accomplish this, with co-operative aid by the public in work-

ing qut the problem as a practical undertaking. As in the case of fire protection, the additional measures necessary for forest renewal should be made a part of a systematic program in which the public and private owners engage in a joint undertaking with a common objective.

The first steps in this undertaking are to determine in each region:

1. The circumstances under which fire protection alone will not suffice to prevent wasting of the land under prevailing methods of lumbering.

2. The additional measures necessary to secure conditions favorable for natural renewal.

3. The classes of land upon which forest growth should be continued.

4. The co-operation that should be given by the public to make feasible in practice the measures that it may be necessary for the owners to take.

5. The legislation needed to bring these measures into practice as a part of the State's program of forestry.

Special Problems in the Central States. In the states of Illinois, Indiana and Ohio, our problem is essentially one of the farm woodland. Here we have to do with small tracts and small operations. In some ways the problem is a simpler one than in the great lumber regions. In the first place the fire danger is easily controlled. Then again the work can usually be brought into close correlation with other phases of farm management. Of great value also is the fact that the owner himself is often the manager and can give personal direction to the work of forestry.

In such circumstances the aid of the states may be directed to educating the farmer in how to cut his woodland in order to secure natural reproduction, how to thin the young stands so as to increase their growth and value, how to reforest the lands now waste, how best to market his woodland products, and so on. Advice should be afforded through the State Forester and the agricultural field agents. Planting stock should be offered at cost, with assistance in establishing plantations. Co-operative marketing enterprises should be encouraged when this is practical.

Public Assistance to Private Owners. As already explained, the public should aid private owners in organized fire protection, in giving direct advice in regard to the methods of handling their properties, and in furnishing planting material at cost.

In many parts of the country the present form of taxation is acting as a detriment to owners' handling the forests conservatively and it even tends to force premature and wasteful cutting. In general, the form of taxation that should be substituted is to levy an annual tax on the land and a yield tax on the timber when it is cut. Each state should give this problem careful study and provide a form of taxation that will encourage the owners to grow trees on their cut-over and waste land. The Federal Government may well give assistance to the states in this study.

Further assistance could with propriety be given by extending to forests the existing legislation providing for farm loans so as to include loans for the purchase and improvement of forest lands, to encourage the holding of lands previously acquired, where the purpose of the owner is to hold and protect cut-over lands or those having growing timber, to reforest lands by seeding or planting, or to use other measures in promoting forest production.

Other measures of co-operation and aid would include research in forestry and forest products, land classification, obtaining and diffusing information regarding our forest resources and industrial conditions. Of special importance is a comprehensive survey of the forest resources of the country, to determine the quantities of existing timber suited to different industrial uses, the current and future requirements of different regions, the possible production of our forests by growth, and other matters that would aid in developing a national policy of forestry.

Function of the Federal Government. The Federal Government has a function not only in owning and administering the National Forests; it should take the leadership in formulating a national policy that includes the right handling of private forests. The Federal Government alone can act effectively to bring about concurrent action as between the states. Its research and educational work may be directed to the problems of the nation and of regions that comprise more than one state. It can stimulate and guide local action where the states acting individually would fail. The Government is in a position to organize all agencies affected by the forest problem in a united effort to carry out a program of forestry.

The legislation directly affecting the private owner in the protection and renewal of forests may best be by the states if they will only take the action. The Government should aid the states in formulating plans and developing methods and should give direct financial assistance in carrying them out.

The Federal Government has not given adequate assistance to the states. It has helped to some extent in fire protection and research. One hundred thousand dollars a year is now distributed to states qualifying under the law to receive it, for organized protective work. This principle of assistance should be greatly extended both in amount for protective work and in scope to include other lines of forest activities.

The direct aid of the states by the government, made contingent on adoption by the former of acceptable programs of forest legislation and administration, would help to secure concurrent action in different states and would make possible the standardization of methods, and the achievement of results impossible without such aid.

The first step in inaugurating a national policy of forestry is a federal law providing the authority to co-operate with the states in formulating and carrying out a program of forestry along the lines indicated in this statement; and carrying an appropriation that can be used to assist such states as inaugurate and put into effect a program determined to be adequate by the Secretary of Agriculture.

A great deal can be accomplished pending such substantial co-operation, but with the aid that the nation might offer, results could be accomplished that otherwise would be impossible.

I may say that there are some people who do not agree that the program of forestry should be carried out through the states. I have, however, undertaken and proposed a program of very greatly increased activities by the states, backed up both in the matter of assistance in carrying it out, and by a large appropriation, without which the states themselves can not possibly get the work under way. (Applause)

THE CHAIRMAN: I have observed your close attention as our national forester gave to us this illuminating paper. Many of the points which Colonel Graves has raised here are to be considered in special papers. I am sure that some of you would like to ask some questions. There will be an opportunity later in the afternoon for this. The next speaker is Mr. J. G. Peters, whose subject is "Co-operation Between Federal Government and States." (Applause)

MR. J. G. PETERS: Ladies and gentlemen, the program which Colonel Graves has presented is very practical. Perhaps the most important feature of it is co-operation, and that is the feature I shall deal with, especially as it applies to the states and the Federal Government.

The progress of any forestry program will depend, in general, upon the extent of co-operation between the private owner, the State, and the Federal Government. Each has an obligation, and each must realize this in an adequate way before the timber supply problem can begin to be solved. In other words, to face the question in a practical manner, the success of the undertaking is going to vary with the amount of money available, for upon this depends whether we shall continue to go along with the customary meager funds and relatively small accomplishment, or whether we shall take hold in man fashion and strive to have something to show for our efforts in the next generation that will really be worth while . This requires adequate appropriations by the Federal Government and the states and adequate participation on the part of private forest owners.

The Federal Government by reason of its centralized authority and its ability to raise funds is the natural leader in such a movement and should, of course, give liberal financial assistance. It has started in certain lines in a small way. With a larger public demand, that is bound to be made, congress will be obliged to take the necessary adequate action.

The interest of the Federal Government is very great. Not only must it protect and manage its own forest lands, the National Forests, but by reason of the general character of the problems of timber supply and water conservation, which affect the entire nation, it also should assist in protecting and encouraging timber production on other lands. Consider this with reference to the states of Indiana, Ohio, Illinois and the rest of the Middle West. None of these states has an adequate timber supply; they alone can not furnish their timber needs. It is a matter of concern to them how these needs are going to be supplied and they are vitally interested in what other states may do. They are interested, too, in seeing the Government extend its aid to them and other states and strive to insure all the states timber for the future.

The most important lines of co-operation between the Government and the states, where co-operative effort is almost essential if results commensurate with our needs are to be obtained, include the following:

(1) Acquisition of public forests.
(2) Protection against forest fires.
(3) Reforestation of denuded lands.
(4) Conservative cutting.
(5) Farm forestry.

Besides these there are other forest activities which either the Federal Government or the states have been conducting independently, such as an investigation of the forest tax problem, a survey of forest resources, land classification, and research. There is no question whatever about their importance, but co-operative effort in carrying the work on is not essential, although in some instances it would be beneficial.

One of the chief features of any forest program must be the acquisition by the public of lands unsuited for agriculture or settlement. It is estimated that the area of such lands now in public ownership should be doubled, that is, we should strive for an ultimate area of some three hundred million acres. National Forests now aggregate one hundred fifty-five million acres; and state forests about four million, nearly three-fourths of which is held by two states—New York and Pennsylvania. Municipal forest areas are negligible. Except where the lands for public forests have been set aside from the public domain, as has been the case with nearly all the National Forests and some State Forests, notably those in the Lake States, the acquisition of such lands has been a very slow process. The Federal Government has been purchasing lands for National Forest purposes since 1911 and, in this period of nearly nine years, the funds appropriated have amounted to only $11,600,000 and the area acquired totals less than two million acres. The cost per acre has averaged about five dollars and twenty-five cents. The appropriation recommended for the current fiscal year was two million dollars; congress cut it to six hundred thousand dollars. The states, with the exception of New York and Pennsylvania, have done comparatively little. New York has acquired nearly two million acres for State Forest purposes, and has recently authorized an issue of seven million five hundred thousand dollars of bonds to supply funds for purchasing additional areas; Pennsylvania has about one million acres; Michigan, Wisconsin and Minnesota between three hundred thousand and four hundred thousand each; ten other states have forests ranging in area from sixty thousand acres to less than one thousand.

As the bulk of the area to be acquired will necessarily have to be purchased, the cost will amount to at least three-quarters of a billion dollars. But at the present rate of acquisition, no material accomplishment can be hoped for in a long time. Especially is this the case with the states, as has been shown. Therefore, it is desirable not only to speed up appropriations by congress and the state legislature but, at the same time, to devise a plan by which the Federal Government can aid the states. I am convinced that some co-operative plan for encouraging the states to adopt an adequate purchase policy is needed. I suggest that the Government loan to the states the necessary funds subject to the approval of the National Forest Reservation Commission, which is the commission that approves the purchase of lands for National Forests. The Government should obtain the funds through the issue of bonds, and the loans should be made on a long-term basis. The National Forest Reservation Commission would make the actual purchases subject to the approval of the similar State commission, and the Government would be secured in the transaction by retaining title to the lands until the debt was liquidated. At the same time the State would be the custodian of the property and

would protect and manage it and collect the receipts. The Government would lose nothing on such deals because it would charge the states enough to meet the interest payments on the bonds, and the states would thus get the benefit of the Government's credit and low rates of interest. States should not find such transactions a heavy financial burden, for the sale of forest products and the fees for grazing and other uses should furnish the money not only to pay the interest on the loans, in many cases from the very beginning, but also to build up a surplus to pay off the loans.

Before passing on the next subject I might pause here to say that some persons, especially some of those who got alarmed over the proposal for a program of forestry on private lands, would have the public buy all the large bodies of cut-over land and would make the public practically the only large forest owner. Entirely aside from the questions of whether this would be good policy in the light of the experience of other nations and whether our public would approve it, the plan would not be desirable as meeting present needs. If what has been accomplished in public acquisition in the past is any indication of what might be expected in the future, it is perfectly apparent that to complete any reasonable program of acquisition will require many years.

While it is urgent that the Federal Government and the states acquire public forests and properly take care of them—protect them from fire, cut them conservatively, reforest them, and so on, their obligation goes much farther. They must, at the same time, recognize their responsibility in encouraging the proper care of private forests, the area of which even after the program of acquisition has been completed will at least equal the area of public forests. The public has scarcely any greater obligation in forestry than aiding in the protection of private forests from fire. Nor is there any forest activity where co-operation between Government and state will bring quicker and better results.

Fire protection is fundamental. It is the chief means of preserving timber growth to the end that forestry may be practiced and a continuous supply of timber maintained. Adequate fire protection will undoubtedly solve a large part of our forest problem. It will save timber now standing and it will promote natural regeneration on most cut-over lands after lumbering.

Already a beginning has been made in co-operative fire protection by the Government and states though in a very inadequate way financially. Nevertheless, enough has been accomplished to demonstrate the practical value of the co-operation, and furthermore a precedent for Federal and State co-operative effort in forestry has been established by the specific terms of a Federal law. This law is the well known Weeks Act which passed congress in March, 1911. It provided for two things, the acquisition of lands for National Forest purposes and co-operation with states in protection from forest fires. The latter provision was an afterthought; it was an experimental feature, but that it is now justified as a permanent policy of the Government the results achieved are conclusive proof.

The appropriation for co-operative fire protection for the current year is one hundred thousand dollars. The law requires that the protection must be limited to private and State lands on the forested watersheds

of navigable streams, that a state must have provided by law for a system of forest fire protection, and that the federal expenditure in any state can not exceed in the same year the expenditure made by the state.

Co-operation began in 1911 with eleven states, in which approximately seven million acres of forest land received protection, two hundred federal patrolmen were employed, and the federal expenditure was only about thirty-nine thousand dollars. The number of states is now twenty-four, the area protected is approximately fifteen million acres, the number of federal patrolmen employed is four hundred, and the federal expenditure is practically the full appropriation of one hundred thousand dollars. These states include all but one of the Northeastern States, about half of the Southern States, the three Lake States, the four in the Pacific Northwest, and California. The chief result accomplished by this co-operation, besides the purchase of a certain amount of protection, has been educational, especially in encouraging states which have had no protective system to enact legislation providing for one and appropriating funds for its support. Furthermore, private owners have been encouraged through state and federal co-operation to adopt protective measures and, where practicable, to organize into associations.

The federal appropriation is allotted to the states on the basis of the greatest good to the greatest number. A maximum is fixed, depending on the number of states to receive co-operation. At first this was ten thousand dollars, but the increase in the number of states necessitated a reduction first to eight thousand dollars and then to seven thousand dollars. The money is used primarily for the hire of lookout watchmen and patrolmen. The watchmen are stationed on prominent points from which the lower country can be seen and forest fires readily detected. By means of telephone, these men describe the location of a fire to patrolmen or fire wardens, who endeavor to secure help, if necessary, and reach the fire as quickly as possible.

As compared with the federal expenditure of one hundred thousand dollars annually, the twenty-four states co-operating are expending about six hundred fifty thousand dollars, and private owners in these states approximately a like amount. The private and state holdings in these twenty-four states which require protection from fire, including both timbered and cut-over lands, aggregate at least one hundred forty million acres. To adequately protect this area will require a minimum expenditure of one and one-half cents an acre yearly, or something more than two million dollars. If, as stated above, these states and private owners are together expending about a million and a quarter, this sum falls short of the estimated minimum by about three-quarters of a million. From these figures, it is obvious that the Federal Government is not recognizing its responsibility in this matter in adequate fashion. Furthermore, these twenty-four states do not include such important timber states as Pennsylvania, Tennessee, South Carolina, Georgia, Florida, Alabama, Mississippi and Arkansas. If these were extended co-operation, the above-mentioned area of one hundrded forty million acres would be increased to at least two hundred millions, for the adequate protection of which the yearly minimum expenditure required would amount to three million dol-

lars. My opinion is, therefore, that when the states and private owners do their part, with the latter disposing of their slash after lumbering, the fair share of the Government in the co-operation would be at least one million dollars.

Before leaving the subject of co-operative fire protection as provided for under the Weeks Law, I wish to say that it is my feeling that the best interests of the public would be served by doing away with the limitation in that law in regard to the watersheds of navigable streams and by placing the co-operation exclusively on the basis of protecting our future timber supplies. Merely because the purchase of lands is limited to such watersheds is no sound reason for so limiting the co-operative fire protection. It places an unnecessary restriction on the expenditure of federal funds on certain lands where protection is urgently needed. All forest lands need protection from fire. This restriction should be removed.

I have in this paper given the subject of fire protection more space than other subjects, and I realize that it is of minor importance in parts of Indiana, Ohio, and Illinois. Still, it is the largest forest problem which confronts the country as a whole, and I realize how very seriously it affects your wood-using industries which draw their supplies of lumber and other forest products largely from other states. Moreover, fire protection is the only co-operative undertaking in forestry which the Government and the states have started on a substantial and permanent basis.

Along with fire protection should go the reforestation of denuded lands. Whatever areas of this character which the Government or the states do not acquire, and the aggregate will be large, will, by reason of the time element and present economic conditions, remain unforested for a long period unless the Government and the states co-operate with the private owners. Some of the states have been doing this for a number of years. The common practice is to sell the planting stock at cost. But even so, the accomplishment in the reforestation of private lands has been almost insignificant both because of the small appropriations made by the states for the purpose and because of the cost of placing the young trees in the ground, which of necessity has largely to be done by inexperienced labor. The present average cost of such planting is in the neighborhood of ten dollars an acre, including the price of the trees which generally amounts to less than half. If we consider first only the most important stretches of denuded lands, it is estimated that the area totals at least five million acres. The cost of reforesting this would amount to approximately fifty million dollars or if one hundred thousand acres could be reforested annually, the yearly cost would be one million dollars. Even so small a program of reforestation would require fifty years. If private owners would enter into contracts with the states by which the former would pay the cost of the planting operation, which would be at least one-half of the total, and agree to give the plantation the necessary protection and care, I believe that the Federal Government would be justified in giving the undertaking the great encouragement that it would, by sharing with the states the remainder on a fifty-fifty basis, or, if I may be specific, by making a yearly appropriation of two hundred fifty thousand dollars.

Some day we shall have in this country a sustained yield of timber an-

nually. Some day we shall manage our forests with this in view. A few organizations, like the larger pulp companies, are endeavoring now to get on a sustained yield basis. But in many cases this is scarcely possible on account of the pressure for quick returns and the method of financing forest lands. The Federal Government and states should co-operate as far as possible in encouraging and aiding private owners to cut their forests conservatively. The way which appears now to be the most feasible is through some form of loan that will enable timber land owners to secure money from the Government or states on easier terms than is possible elsewhere, and a change in the method of taxing forest land. It has been suggested that the provisions of the Farm Loan Act be extended to include the financing of forest properties and that Federal Forest Loan banks be established. By whatever financial and taxation plans the conservative handling of our forests is made possible, the Government and states might co-operate further, and follow the custom in some foreign countries, by detailing foresters to the owners of the large, so-called commercial timber tracts to assist in the execution of the work.

The conservative handling of forests connected with the farms can be very largely encouraged through the agricultural extension work conducted under the Smith-Lever law. The appropriation under this law for the current year is over four million five hundred thousand dollars which, for the most part, the states must duplicate. The money is allotted to the states on the basis of rural population and is expended through the States Relations Service in co-operation with the Director of Extension in the various states. The work is chiefly demonstrational and is conducted by county agents right on the ground. One can readily see the possibilities in this for extension in farm forestry. It offers practically a virgin field. No phase of forestry is of greater importance to the states of Indiana, Ohio, and Illinois, than the proper handling of farm woodlands on the basis of continuous production. The area of farm woodlands in these states is about ten million acres, which is something like ninety per cent. of their aggregate forest area, and farm woodlands occupy between ten and fifteen per cent of the area in farms.

As in agriculture so in forestry the most effective way to encourage farmers to adopt scientific practice is through field demonstrations on their own property or in their own locality. Of course, any increase in the value of products is an additional incentive. Farmers have given little or no attention to the proper handling of their woodland and they have been strikingly ignorant of the value of wood products. As a rule, they are chiefly interested in getting immediate returns from the woodland and care little about its future development. This fact should serve as a method of approach in encouraging them to cut their timber conservatively. In other words, they must be assisted in getting larger revenue if they are to become more interested in improving the woodland and raising more and better timber. To this end farmers need to be given practical information about markets for the various kinds of timber, methods of selling, the variation in the common log rules used, and where practicable the grading of lumber. In some cases it may also be feasible for the farmers to form co-operative marketing associations similar to other agricul-

tural associations for marketing purposes, since an association of this kind would be able to get the advantage of cheaper freight rates and market the material to better advantage than the individual owner.

Farm forestry should be an important branch of farm management, particularly in connection with diversified farming, such as is practiced in this region. It offers the opportunity for the use of otherwise idle land. The forest on the farm is the source of much wood for home use such as fuel, fence materials, and rough building stock, and where coal is largely used it affords a reserve fuel supply; it acts as a windbreak for crops; it affords shade for stock; it offers an opportunity for the profitable employment of men and teams at times when other farm work is light; it helps to check erosion, and it brings in revenue from the sale of wood products. Surely in this region the most should be made of the farm woodland.

Farm forestry is recognized by the States Relations Service as coming within the scope of extension work authorized by the Smith-Lever law. But before it can be conducted on an adequate scale the Forest Service must have additional funds so that trained foresters can be employed to direct the work. The states would then be authorized also to employ foresters with Smith-Lever funds to work in the various counties as extension foresters who would conduct demonstrations, give practical information to the farmers, and instruct the county agents in forestry practice. In the states of Indiana, Ohio and Illinois, it is urgent that co-operative work of this character should be started and aggressively carried on.

I have endeavored in this paper briefly to describe the main features of the important lines of co-operation which the Federal Government and the states should undertake, or which, if already begun, should be largely extended. The question is chiefly one of making funds available. This is for the public through congress and the state legislatures to decide. The public is being given the facts about our forest problem by the state and federal forestry departments and the various forestry associations. May we hope for an adequate response. (Applause)

THE CHAIRMAN: Before taking up the discussion of these two papers, I am asked to call your attention to the fact that at eight o'clock in this room there will be a banquet, the price of the tickets being two dollars and fifty cents, and those who plan to attend should get their tickets immediately. Also if you are thinking of accepting the invitation to visit the experimental farm which Mr. Lieber is conducting, you should see the secretary for particulars and give him your name so that accommodations may be made for those who wish to go.

DR. LOGAN: I would like to ask Col. Graves to what extent aeroplanes are being used in fire protection.

LT.-COL. GRAVES: We have secured the co-operation of the War Department during the past season in California and there has also been some work done in Oregon. The original plan was to get as many track fields, located in different parts of the country, as possible, but there wasn't money enough for that so all that could be done was to have a little work done in their fields. In the long run I believe it will be too expensive

to have separate air service. Now we have a patrol on a forest in southern California and in central California and we have patrols in certain parts of Oregon. So far the aeroplane service has proved valuable and very interesting. There are a good many things that the aeroplane can see that you can't see from a signal station. We have also tried the stationary balloon, but a man in an aeroplane which is moving over the ground can see things that the stationary object can't see. A good many people believe that a small dirigible would be a better instrument than the plane, but we haven't had an opportunity to try it. Of course the greatest difficulty that we have is in the remote, undeveloped wilderness where we have no roads, no trains and can't get to the fires quickly after they have been discovered.

We don't go far enough. We don't accomplish what we start out to accomplish because of lack of funds. I don't know of a state that is getting enough money to carry on protective work.

THE CHAIRMAN: Do you find any opposition to federal encroachment on state reservations?

LT.-COL. GRAVES: This plan as I have proposed is assisting the states along these lines. The federal officers are working under the state forestry.

THE CHAIRMAN: The reason I asked that question is because I have had a small part in the admission of the Smith-Lever act in Illinois. I have been surprised to find how many people there are who are a little bit alarmed at the thought of federal inspectors working instead of the state when the federal government is furnishing large sums of money for vocational education. I wonder if you have found in any of the forestry propositions as you have presented them to us this afternoon, any objection anywhere to federal supervision.

LT.-COL. GRAVES: I have found no objection as far as I have proposed it. I have, on the other hand, found a good many persons who think I do not go far enough.

PROF. BLAIR: Mr. Miller in his paper this morning, pointed out that in the State of Illinois there are some six and a half million acres of land which might better be used for forestry purposes than for other uses. Now we are not especially interested as a state in the matter of fire protection, but we are interested in the proposition of co-operation. It is now a question of what we must do as a state through the legislature to get the co-operation that we need from the federal government.

LT.-COL. GRAVES: I'd like to see that incorporated into a law setting forth that principle and appropriating funds which could be used by the Secretary of Agriculture. I would make the law very broad so that he could attend to reforestation and participate in the establishment of nurseries in the state. I would like to see the state of Illinois go a good deal further than they have so far.

THE CHAIRMAN: I have had a question in my mind as to what those charts are up there.

MR. PETERS: I might say that they are prepared to show the lumber production in these three states and the men employed, and the relation of

wood-using industries to all other industries as to the number of men employed, capital invested, and value of the products.

You will notice in Illinois there are 140,000 men employed in the wood-using industry, while there are 620,000 employed in all industries. In Indiana there are 265,000 men employed in all of the industries with 70,000 employed in wood-using. In Ohio there are 600,000 in all industries and 90,000 in wood-using.

In Illinois there is $2,000,000,000 invested in all industries with $400,000,000 invested in lumber using industries. Indiana has $675,000,000 invested in all industries with $175,000,0000 invested in wood-using industries. Ohio has $1,675,000,000 in all industries and $160,000,000 in wood-using.

The value of all products in Illinois is $2,250,000,000 and the value of wood-using products is $320,000,000. The value of all products in Indiana is $730,000,000 and wood-using products are valued at $140,000,000. In Ohio the value of all products is $1,785,000,000 and the value of wood-using products is $175,000,000.

MR. LOVEJOY: The figures of these charts show that the wood-using industries employ a large proportion of the men in our three states and that a large proportion of the capital invested in all industries is invested in lumber-using industries. I am wondering if the timber deficit is likely to be so great as to seriously injure these industries.

LT.-COL. GRAVES: That is a very direct question which should be answered by a result of a direct study. I can only answer that in general terms. I have talked with a great many mill men and asked them how much of a supply they have ahead and inquired if they are still able to get material. They haven't a definite supply ahead but they seem to think they will be able to get their material whenever they need it.

MR. LOVEJOY: Does it seem likely they will be secure for a period of ten years?

LT.-COL. GRAVES: I think so.

MR. LOVEJOY: Timber is a long-time crop and if anything is to be done upon an adequate scale it should be done very shortly.

LT.-COL. GRAVES: Both of the estimates apply to the higher grade timber. We need in the first place the husbanding of material of medium size. We need to prepare ourselves for the exhaustion of that material and start to grow material. I presume that material will be found that can be substituted for the best grades which will tide us over in a measure if we start now. If it is taken hold of immediately, I think there is a chance of tiding over.

MR. LOVEJOY: Then you would anticipate that conditions would become really serious if something is not done?

LT.-COL. GRAVES: Yes, I think they would become very serious. Many plants would have to go out of business.

THE CHAIRMAN: Do you mean that wood used in many things would be laid aside and some substitute devised?

LT.-COL. GRAVES: That would be done to a certain extent. But

we have never found a satisfactory substitute for wood and I don't believe we ever will. Wood is a better material for a great many uses than any substitute, but we could get along if we had to, but not otherwise. I think it is very urgent that we take steps now.

THE CHAIRMAN: The statement has been made that the average man who has any wood-holdings at all has no conception of their value and that people will sell woodlots and wood-holdings without ever stopping to consider their value. Great sums of money are invested in this part of the country in wood-using industries and the supply is steadily growing smaller and certainly under such a plan, it will soon disappear, so it seems to me that the most important thing to be done is to constantly issue this call of danger. People don't understand how important this subject is and it is hard to enlighten them. But if we don't arouse them it will be mighty serious.

SENATOR GUTHRIE: One of the important questions is how to protect what we already have. This state is a large, rich state, most of which is being farmed. As Mr. Deam told us this morning, we have some small areas of timber and we want to know how to protect them. We still use wood for ties and today we are getting about six times the amount we got for the first ties we sold. We have never found a substitute for ties. In our state the scarcity of timber is getting to be a very serious question. I think that we should protect the young timber in some way and show the people that there is nothing more profitable than raising timber, if it is handled in the right way.

MR. SECREST: Colonel Graves, have you anything in mind relative to a timber census of the entire country?

LT.-COL. GRAVES: I proposed to have an economic survey of the timber resources in connection with the present census. There is a bill at congress now setting aside one hundred thousand dollars for a survey of materials. Of course that would be quite inadequate.

Senator Guthrie, why wouldn't it be possible for the state of Indiana to adopt a program of acquisition of forests on a much larger scale than heretofore?

SENATOR GUTHRIE: That is what we want to do.

LT.-COL. GRAVES: I feel also that we have got to get forestry to the agricultural man. I judge from the papers given this morning that they haven't appreciated the place of forestry in agriculture.

Now what are we going to do without wood? What substitute are we going to use? Metals? I don't think so for an instant.

THE CHAIRMAN: I am advised that it is necessary that we adjourn so they can get this room ready for our banquet tonight. Unless there is some other question or some other matters which ought to be considered at this time, I will entertain a motion for adjournment.

ADJOURNMENT.

WEDNESDAY EVENING, BANQUET SESSION

The meeting was called to order at 8:00 p. m., with Mr. Walter Crim, President of the Indiana Hardwood Lumber association, presiding.

MR. WALTER CRIM: Gentlemen of the conservation conference and distinguished guests, we are certainly very glad to see this liberal turn-out this evening in honor of the movement inaugurated by Indiana, Illinois and Ohio in conserving the forests of our states. This is an opportune time to start a movement of this kind and as usual, Indiana is glad to be in the foreground with the assistance of her sister states.

I don't know why you should pick a lumberman to start the ball rolling tonight. But I am glad to say that our entire Board of Directors is here in a body attending this meeting. No movement of this kind is successful without a good ringmaster. In Indiana we have had many orators and writers but we have kept the best at home and I am very glad to introduce the Honorable Charles Bookwalter, who will take charge of this meeting. (Applause)

MR. BOOKWALTER: As I look over this illustrious and dignified array of talent, I feel that this limited program that I hold here in my hand somewhat checks the possibilities of the evening's festivities because as the majority of you are from Indiana, and Hoosiers being orators, it may take us until the wee small hours to get everything said that we want to say.

I suppose all of you think that to make everything fitting and proper, we should open up with a talk by the Governor. I am almost in bad because I insisted that he should make a few remarks and he insisted that he should not be called upon, so I am going to keep faith with him. But I will say that this bland gentleman sitting at my right presides over the destinies of the state of Indiana.

The toastmaster is not expected to make a speech, but as soon as I get on my feet, I readily fall into my weakness of talking too much. But I am not going to do that tonight, although I would like to talk about your problems. Some of my kind friends tell me that I can talk more at length and most entertainingly on those subjects which I know nothing about. (Laughter) I am sorry to confess that I know nothing about forestry except what I have learned as a businessman of the world.

Indiana, Illinois and Ohio are the very garden spots of the world. But I do watch these things as I pass through life and I have thought of these problems and I have read about them. I am not going to abuse the lumberman. He is not guilty of destruction except when he cuts indiscriminately —he only cuts what the necessities of man compel him to cut. We must reserve, not so much preserve, but we must replace the timber that we are using now.

Yesterday I came down from northern Indiana. I had gone up in Wabash county on a business trip and as we were driving back we passed an eighty-acre woods. It was just as God had planted it—it had never been cut at all and nothing in it had been touched. I said to my friend, Charlie Greathouse, who was with me. "Look at that; isn't it wonderful?" "Yes," he said, "that is a remarkable woods." We stopped our car and sat in silence just looking at that magnificent picture.

All of the land in this part of the country was at one time covered with forests just like the one that we stopped to look at, but this wonderful country has been stripped bare. We must not continue to do this without

replacing in some measure the trees that we have destroyed. We must think of the future of this country. Man is naturally a destructive animal. If you don't believe that, just keep your eyes open. So this sort of a conferences comes at this time particularly "pat" for the people of Ohio, Illinois and Indiana.

Now I am going to present the first gentleman on the program. Mr. Pack is unable to be here this evening and Mr. P. S. Ridsdale is to fill his place. (Applause)

MR. P. S. RIDSDALE: Mr. Toastmaster and gentlemen, Mr. Pack, who was to speak to you this evening, is ill and is unable to be here. He caught a bad cold recently and his physician forbids him to leave his home. He has asked me to be his substitute this evening and so I would like to read to you a little article which Mr. Pack had planned to read.

"I do not believe the human mind can devise a more suitable memorial to Theodore Roosevelt than a movement which will look to preserving the forests of this country. Knowing the man, as it was my privilege to know him, I am positive that could the selection of a memorial be left to his choosing he would say 'save the forests.' As president he called the first conference of governors which took up the great questions of conserving our natural resources. He was our greatest exponent of the value of these resources and of the value to the nation of outdoor life.

"You foresters can do a great work in directing the public mind to these values. You must take the public into your confidence and the way to do that is to tell your story to the editors of the country for without them your progress will be as that of the snail—you may get there some day but without the editors I firmly believe you will have arrived when there are no forests to conserve. Our forests are like a bank account; they cannot be continually drawn upon without making some deposits.

"If you expect to see a national forest policy adopted in this country you have to show the people the necessity for it as they are the ones who pay the bills. There is but one way to show the people and that way is through the editors. The editor is the spark that stands between your lever —the forest policy, and the motor—its adoption. Show your editor what a forest policy means and where our forests, one of our great natural resources are going, your motor starts and your battle is nine-tenths won.

"The force of public opinion today is working 'on high' on several questions. Turn that force toward a national forest policy. Show your editor what a national forest policy will do and the wheels will begin to turn. Show him how a national forest policy adopted one hundred twenty-five years ago in France saved her and civilization. Show him how the forests of France held back the Hun from Paris. Show him the figures that estimate last year's forest fire losses to be $28,500,000. Show him what a national forest policy means to his paper bill. Show him that the net growth of timber is not more than one-third the amount which is being used or destroyed every year. Show the editor these things and you show the world.

"The time has come for forestry to be taught as a science in a college, to become a subject for popular thought. The people must be interested in trees. The American Forestry association is conducting a campaign for

a national forestry policy by telling the people how vitally necessary it is to them. It is also conducting a campaign for memorial tree planting and for roads of remembrance which is the road side planting of trees as memorials to the heroes of the great war. I hear some good foresters say that it is not forestry. Before you can become initiated into the mysteries of where the milk comes from you must first get acquainted with the cow. Before you can hope to enjoy the delights of Shakespeare you must first give some thought to the construction of the English language. Before the producer puts on a play he spends thousands of dollars in an endeavor to get an audience for that play. Before you foresters can ever hope to interest the public, which is the court of last resort in this country in a national forest policy, you have got to interest that public in *a tree.*

"That is just what the American Forestry association is doing. The response on the part of the editors has been magnificent. As a result the people are planting trees as never before, as memorials to the man who gave his life or offered his life to his country. I could recite here hundreds of places where trees are being planted. Roads of remembrance are being laid out and memorial groves and parks being planted. Does anyone doubt that those people will listen with a ready ear to the reasons for a national forest policy? They are getting acquainted with a tree. As a result you will be able to talk trees to them.

"If the people of the United States want to erect a real monument, a lasting memorial for all time, in honor of Theodore Roosevelt, let them mark his birthday next Monday, October 27, by starting to work in earnest for a national forest policy. You can celebrate 'the coming of age,' the twenty-first anniversary of forestry being taught in a college, in no better way than by taking the public in on the celebration.

"You gentlemen are the ones to take the lead. Some of you represent forestry and some of you the lumber industry. Get together first on a fire protection policy. Then get together on other features of a national forest policy. Let me quote just a paragraph from the opening address of Mr. Roosevelt, the then president, to the congress of governors in 1908. I quote, 'Every step of the progress of mankind is marked by the discovery and use of natural resources previously unused. Without such progressive knowledge and utilization of natural resources population could not grow, new industries multiply, nor the hidden wealth of the earth be developed for the benefit of mankind. We want to take action that will prevent the advent of a woodless age and defer as long as possible the advent of an ironless age.' Those words have even greater weight today, since a world war has made such inroads on our resources, than the day they were spoken. Call your findings the Roosevelt Memorial National Forestry Policy if you like the suggestion, and you will have honored the man who did so much in pointing to the value of our forests. In any event, you will have done the greatest of services to posterity—you will have saved our greatest natural resource for that posterity." (Applause)

MR. BOOKWALTER: This evening just prior to my departure from home I was talking to the members of my family about this particular occasion. A member of my household was an officer in the late world war and served in France. He said to me," Well, Dad, if those men down there

want to find out how much a tree is valued, tell them to go over to France." He then told me about an incident which happened in a rest camp in which his battalion was placed. They were constructing a retreat when a hard-boiled old sergeant concluded that they needed a tree as a sort of a screen and began poking around to find one. He finally decided on a young sapling about four inches in diameter and promptly cut it down. A hornet's nest broke loose around his ears. A major rushed up and yelled, "Who cut that tree?" The French had command of each billeting sector so a Frenchman rushed up and demanded to know who cut that tree. Before they got through with that sergeant, my son said that he was afraid the story would get to General Pershing himself. Those people over there no longer have the forests that we still possess. Practically all of their trees were planted by man so they have learned to value them. But we go on and waste our heritage like a nation of drunken sailors and when somebody comes around with a suggestion that we should not only conserve and protect that which we possess, but map out a policy of replacement, the matter is treated as a source of jocularity.

I met a friend of mine down stairs before I came up here to speak to you and he said: "Well, what bunch of cranks are you going to talk to this evening?" People of this day consider a person who has a problem a crank. I thank God that you men are here to work out ways to protect our land for coming generations. It is necessary to cut our trees, of course, but they should be cut only as our needs demand, and cut wisely.

I am not going to make a speech, I am just going to present Professor H. H. Chapman of Yale Forest School. (Applause)

PROF. H. H. CHAPMAN: When I was asked to address this conference, I consented, but I did so before I knew I would have to present my paper at a banquet. I am afraid this is going to seem very dry to you and I think another subject might have been presented with much better grace at this time. The subject of forest taxation has the reputation of emptying the hall faster than any other subject. (Laughter)

From the time when the possibility of handling forest lands to produce future crops of timber, instead of stripping and abandoning them, was first discussed in this country, two arguments have been advanced by forest owners as imposing insuperable obstacles to the undertaking of forestry; namely, fire and taxes. Lumbermen in Minnesota and elsewhere expressed themselves eager to maintain their forest lands in growing timber, but unfortunately such a policy required investments in holding land, young timber, etc., and there was no reasonable chance of realizing on this investment because of the certainty of destruction by fire, or confiscation by taxation. Therefore they were reluctantly compelled to strip the land bare and let it burn.

Foresters met this challenge by undertaking to provide fire laws and administration and the time is approaching when the risk of destruction by fire will be brought under reasonable control—it never did present much of a problem in hardwood regions of farm woodlots.

At the same time the question of reform in forest taxation was taken up, but here very great obstacles were encountered and up to the present time no general solution has been reached, nor are there any laws in operation which have become generally used or promise to meet the situation.

Yet if we are to grow forests on private lands, the "risk" of confiscatory taxation must be met or else it will continue to be cited as an obstacle which prevents the contemplation of forestry by land owners, much as they might desire to practice it.

Is the present system of taxation an obstacle to the production of timber on forest lands? Or is this conception a convenient myth, to color a failure to put these lands to a use in which the owners have no interests or are deterred by other, quite different, factors? The main reason why lands are not devoted to growing trees are, that Americans as a class do not understand the business of forestry, its practice, its economic advantages or its necessity as a measure of general property and public economy, and having in the main, destroyed the forest capital by a mistaken policy of clean cutting, are loth to undertake the restoration of the business by the time consuming process of tree planting and growth—so many obstacles look big to them, and taxation becomes a serious stumbling block.

Is the general property tax a burden sufficient to prevent or discourage the undertaking of growing crops of timber? This is a very different problem from that presented by the annual tax on timber which is already mature and fit to cut. Annual taxes on standing mature timber tend to force cutting. But mature timber ought to be cut—if held for long periods, it represents an economic waste. The community is deprived of the use of wood, incurs a loss of wages, industries dependent on wood suffer, and a form of capital which represents taxable wealth escapes its just burden of taxation. This is especially true, since virgin timber has usually cost the owner nothing in the way of expense for production—it is not an artificially grown crop—the only expense is fire protection which is a form of insurance similar to that placed on any property, and taxes. The investment of capital in mature timber is often for speculative purposes, with no thought of engaging in forest production. It is true that large timber operators often find it necessary in order to insure a supply of raw material, to acquire a twenty year supply of timber, the taxes on which may prove a large item of expense. When this supply is so great as to require fifty years to remove it, the holding can be considered largely as purely speculative, and not needed for the conduct of a normal operation, and it is not good policy to relieve speculators of a just burden of taxation in order that they may realize expected profits from which the community gains no advantage. The tendency of taxation to force the cutting of timber is not in itself the evil to be met—this problem should have been solved in quite another way; namely, by retaining the ownership of these large timber reserves in public hands as was done with the national forests.

Another reason for taxing timber is that the growth in virgin timber is negligible, being offset by decay and other natural losses, so that the productive capacity of the land is not put to its proper use but is stagnant.

A final reason for continuing to tax mature timber is the loss in public revenues which would result from exempting such property from taxation, and which would tend to defeat any effort to bring about such an exemption.

The arguments of owners of standing timber; namely, that taxation would prevent their utilizing the land after cutting to produce new crops of timber is not an argument for relief from proper or equitable taxation of timber already grown.

Is there then still a problem of taxation connected with timber? There is. The admitted fact that annual taxes on standing timber hastens the cutting and makes holding unprofitable, tending to increase the cost of lumber, acts with equal force to discourage the production of new crops. Owners and operators come to believe that if taxes on standing timber are a heavy burden, it would be a still greater burden on land devoted to forest production, when extended over the long period required to grow a crop. And they are right.

While necessary as a present day measure of revenue production, on timber purchased as an investment, the principle of taxing property values instead of income creates this undue burden of taxation just so long as it is impossible to realize the income with which to meet this tax. This results from two factors. First, the total tax or sum of taxes paid on such non-productive property continually increases with the period of holding which explains the difficulties of large speculative holdings. Second, it is not the same thing to pay out a given sum at the time the revenue is realized from this property and to pay this same total amount at periods anywhere from one to forty years in advance of this income. In the latter case mathematicians compute the total equity at compound interest and for periods of twenty years or more, even the most reasonable rates of interest will give a total cost of from three to ten times the actual cash outlay.

These facts are well known to investors and while the purchaser or owner of mature timber has the opportunity or choice of cutting, no such choice is presented to the owner of land and growing timber who, in order to get revenue would have to go out of business; namely, sell the land itself. It is therefore perfectly fair to state that unless a different system of taxation is applied in the future to property represented by growing timber, few will have the courage to attempt the undertaking or to cut their mature timber in a manner so as to secure reproduction by leaving a part of the stand, the younger trees, as an investment in forestry.

Accepting past and present conditions as a necessity, does not mean that we can ignore future conditions. If we wish to continue to have timber it will be necessary to grow it. Nature unaided will not produce the goods. There is not time to discuss this at length, but the statement is based on wide and close observation of the conditions in which cut-over land is left after logging with no thought for the future.

It is therefore the absolute duty of states to provide a different and equitable system of taxation for timber. This need has been almost universally recognized and nearly every eastern, northern and prairie state has legislation of some kind intended to encourage the growing and planting of trees. Yet up to this time not one of these laws has solved the problem nor do any existing laws even promise to accomplish the needed reform.

Why have these laws failed in practice? The answer in every case is that they have sought to create special conditions or exceptions in the nature of privileges, to such owners of forest lands as agree to carry out special measures; namely, practice forestry, and have never attempted

to create correct conditions applicable to all timberland, without discrimination. To these special conditions have been tied numerous special requirements of procedure, or red tape, often accompanied by a burden of inspection, penalties for failure to comply, or regulations of methods of management. The cost of the proposed systems to the owner far exceeds the privileges granted, and the cost of administration by the state is too large in proportion to the benefit derived.

The initial mistake was to grant bounties, tax rebates, tax exemptions, or low fixed valuation of forest lands as a reward for planting or growing trees. The reasons for failure lie in the general system of assessment of taxes. Such lands seldom form more than a small portion of any taxable unit. Local assessors resent such exemptions, and nullify their effects by adjusting other assessed values so that there is no saving to the owner, who is put to the trouble of complying with additional formalities to secure a fictitious gain. The general underlying principle of such laws is wrong, for if we are seeking to correct an injustice or inequity in taxing timber, all such property is equally entitled to the benefits of this reform rather than to attempt to set up an elaborate system of separating sheep from goats, in which the goats being numerically superior will ultimately see that the special privileges are wiped out.

Private property is not usually taxed according to the intention of the owner as to its future use, or his actual method of handling it, but solely on the basis of the material values present. Yet every law for forest tax reform has disregarded this fundamental fact, probably confusing the idea of possible public benefits with that of public ownership and use.

This error has created insuperable difficulties of which a few may be cited:

1. The effort to fix and reduce the assessed value of forest land has required:
   - (a) Clssification of land.
     - 1' on basis of intention of owner to practice forestry.
     - 2' on basis of suitability of the land for forestry.
     - 3' on basis of the value of the land, to prevent misuse of the law by speculators to avoid taxation. (This factor has caused the vetoing of some such laws.)
   - (b) It has at the same time threatened to so reduce local revenues that its final overthrow would follow its widespread application. It is self-defeating.

2. The effort to require the practice of forestry on such lands as a condition of receiving this privilege has required:
   - (a) The parceling of holdings into separate lots, with maps, descriptions and legal forms, special blanks, listings and assessments.
   - (b) The compulsory incurring of expense for planting or other measures, not required of other forest owners.
   - (c) Special provisions for penalties in shape of back taxes on withdrawals of lands from the special class.
   - (d) Limitation of maximum areas to receive the supposed benefits of tax reform.

(e) Special contracts to cover the obligations incurred by state and owner.

(f) Cumbersome procedure in accounting and in payment of products taxes.

(g) Cumbersome efforts to distinguish between age classes, and land bearing mature timber versus plantations, which features are most difficult to administer as part of a tax system.

(h) Burdensome requirements on state forests in the line of ininspection of small widely scattered tracts to see that various phases of the law relation to valuation, practice and products tax, are carried out, for which if the law were a success, these officials would have absolutely no time unless the staff were increased.

These laws all attempt to shift the burden of taxation, either to other land owners or as in Pennsylvania, to the state instead of trying to apply a universal tax reform, and permitting the operation of this reform to effect such improvements as other conditions render possible.

What we need is a plan which will not only remove the inequality of the present system, but which will remove it on timber as a class of property throughout the state, namely, for all owners of timber. There are three requirements of such a law.

1. All forest economists are agreed that the value of timber should be separated from that of land for purposes of taxation, and that the timber should, if possible, be taxed in the form of a products tax when cut in lieu of annual taxes.

2. It is not generally agreed that local revenue from taxation should be maintained, and the products tax substituted gradually.

3. It is not so universally conceded, but I believe is to be equally essential that virgin timber should continue to bear an annual property tax and that the reform should apply to future, artificially grown timber.

The law which comes nearest to satisfying these requirements is that of Massachusetts. This in turn was based on the Connecticut law.

The Connecticut law required the separate valuation of standing, merchantable timber from land—but it attempts to fix the value of land for fifty years and to limit the tax rate to ten mills. Then to avoid speculation, it limits the value of such lands to twenty-five dollars per acre. Standing timber is taxed annually until cut, but young timber will pay only a products tax.

Massachusetts was the first state to establish the principle that no effort should be made to fix or lower the assessed value of bare timber, the land is assessed at its fair value as bare land and pays annual taxes. This value may be adjusted when changing economic conditions make it necessary. This brings all land of whatever character, value or location under the operation of the law provided only that the owner desires to take advantage of it. The merits of this universal classification are:

1. That it wipes out the necessity of classifying lands.

2. That it insures steady and continuous local revenues, and the possibility of adjustments of values.

3. That it does away with the false principle of special privilege in assessed values or rates of taxation.

The abandonment of the idea of limiting the power of assessors to raise land values is a hard point to concede for advocates of forest tax reform. But it is the first step towards any lasting progress, and must precede the educational movement which will be needed to secure equitable valuation of forest land, based on its value for growing timber. If assessors can so easily defeat the purpose of special privileges, they will continue to show a certain amount of unfairness in valuing lands belonging to different owners, but it will be much easier to correct these inequalities when all owners of forest land are equally interested.

The second distinct gain which the Massachusetts law presents is in its plan for taxing standing timber. In effect this is to continue the annual tax on the present assessed value of this timber until it is cut or destroyed, but to arrange for the substitution of a products tax in place of this system, as soon as possible.

For this purpose, after the original separation of assessed value into land and timber, the value of the timber can not thereafter be increased. But as fast as the timber is cut, and pays a products tax, this assessment is reduced. The basis of reduction is value, not quantity. The purpose is, to maintain the original total assessed value of the property, land and timber, thus maintaining the town revenue from annual taxes. The chief merit in the law is, that only the original assessed value of timber pays this annual tax. Growth in value, or growth in volume is not so taxed. Value of the timber cut is the basis of wiping out this value of standing timber. So that if any such increase in value or growth occurs, it is not necessary to cut all of the timber in order to do away for the future with the system of annual taxes on the timber.

Since all increases in assessed valuation of timber are prohibited, the owner of timber who manages it to secure growth, or who leaves young trees or a part of the stand for forest investments, and the owner of land who plants it or of immature timber who protects it, is assured of relief from all annual taxes on standing timber for the future. He does not pay these taxes on any timber except the present value of his present mature stock, on which as we have seen he should probably pay in any case. By paying on this value, the town revenues are absolutely protected for the present and near future. It is an equitable arrangement for the taxpayer and for the community.

The third provision of the Massachusetts law is the products tax, imposed on timber at the time of cutting. In this law the payment of this tax is the means of securing the reduction and final abatement of the annual tax on standing timber. This would appear to threaten double taxation. But in effect, this danger is done away with by fixing the amount of the tax. This law increases the tax one per cent by five year periods up to a maximum of six per cent. on the value of the timber on the stump at time of cutting.

The justification of imposing a products tax on timber which has been

paying annual taxes lies in this—that the owner has, under the law been protected from increased assessed value on his standing timber and can therefore predict what his taxes on this timber will be, and that actual increase in either or both value, and volume, is sure to occur, which will not be taxed annually.

The real purpose of imposing the products tax is to substitute this tax eventually for that on standing timber and to avoid the impossible condition of imposing one kind of tax on a part of the timber cut in a region, and another kind on the remainder. Young timber which has never paid an annual tax must pay a products tax when cut. It is impossible to separate this timber, physically, from timber which has borne the annual tax. But it is a very simple thing to keep account of the original assessed value of standing timber and wipe out this value on the payment of products taxes from any timber grown on the owner's property. When this process is completed, the substitute of the products tax for annual taxation is complete for that property.

This Massachusetts law failed as did its predecessors, not because these principles were unsound, but because it still retained the principles of classification, and of special requirements to practice forestry by stocking the land with timber together with the need for special listing and records. Less than fifty owners have availed themselves of it in five years.

If we can accept these principles as established, there then remains one feature to make a practicable law—universal application and simplicity of procedure—the abandonment of special classification for timber as well as for land and the establishment of the principle of taxing as such, and not taxing the owner's intentions. This means doing away with the impractical features of the law, namely the special classification of lands and their registration, the requirements regarding planting, etc., and inspection by state officials. But does this leave any forestry?

The answer is that forestry will never be crammed down an owner's throat by a tax law. Given a square deal in taxation, the owner is free to choose what use his land is to be put to, and the handicap against forestry is removed. This should be the purpose of the law rather than a thinly disguised attempt to cajole occasional individuals into placing themselves under state control.

This leaves a clear field for educational forces in forestry or even for measures of necessary regulation, to apply to all alike.

Can a law be framed which can be applied to all land owners within a reasonable period? I believe it can if we do not require impossibilities. To accomplish this we must depend on the existing local machinery and make its requirements such that they can be met by land owners and so that it will be to their advantage to do so. The plan proposed is as follows:

1. Establish by law the principle that all lands when reassessed for taxation, must have the value of standing timber separated from that of land.

2. Provide that the value of standing timber when so determined, shall not at any time thereafter be reassessed or increased.

3. That the value of land, separate from that of standing timber shall

be that of similar wild or unimproved land in the vicinity and that the value if any, of immature or young timber shall not be considered in assessing the value of such land, but that land bearing such young timber shall be assessed the same as wild unimproved bare land of similar quality.

4. That at any time within five years of passage of the act, any owner of land bearing mature timber may declare the value of that timber and that thereupon the proper officials shall separate the assessed value of the property belonging to the said owner, into two parts, the sum of which shall equal the former assessed value of the property. The value of the timber shall be entered in a separate record for purposes of future taxation, and shall be assessed annually at current rates but shall not thereafter be reassessed or increased. The remaining value shall be the assessed value of land and other property, and shall be assessed as before, so that the sum of assessed values shall remain the same as the total property as if the separation had not been made, for a guaranteed period of at least three years.

5. That in consideration of declaration of value of timber, there shall be no revaluation of the land for a period of three years thereafter, and that in consideration of the fact that whatever valuation is placed by the owner on the timber the owner thus fixes the residual value of the land for taxation, and that the total value of the property is neither increased nor decreased, the assessors shall accept without review the value of said timber and not increase the same, since such action would either decrease the assessed value of the land or increase the value of the total property before the end of the period of three years agreed upon.

6. That at the expiration of three years from date of declaring the value of the timber, or at any time thereafter, the value of the land may be reassessed but that said assessed value shall not include the value of any timber whatever, young or mature, and shall not exceed the value of the wild or unimproved lands of similar character in the vicinity.

7. That in the absence of a declaration of value of timber within the period of five years, the value of the property shall be assumed to be that of land bearing no timber of taxable value, until reassessed. But that before reassessing any land on which no timber values have been previously declared, the assessors shall ascertain whether there be any timber values on said land, and shall in every case separate said value for purposes of taxation.

8. That from date of passage of law, a products tax shall be assessed upon the stumpage value of all timber cut from the land except such timber products as are used on the land belonging to and assessed against the same owner or by the owner in the same town, for domestic use or improvements having a taxable value. That this tax shall be one per cent. of the said value for the first ten years following the passage of act, and shall increase one per cent. for each succeeding decade up to a maximum of six per cent. provided that nothing in this section shall prevent the payment of a products tax on said exempted products for the purpose of obtaining a reduction of assessed valuation on said standing timber.

9. That the value of any timber stumpage which has been declared by

owner before the products tax was paid, or which has been fixed by assessors, in absence of said declaration by owner shall be reduced for purposes of future annual taxation by the amount of the value of stumpage upon which said tax is paid, provided, that said value of stumpage upon which said tax is paid must have reached a total of at least five per cent of the original listed value of timber taxable in any one town assessed against said owner, before said reduction in assessed value becomes operative, and provided, that when the value of said stumpage upon which the tax has been paid shall have equalled the original declared or assessed value of the timber listed by the owner, said annual taxes shall cease and thereafter any timber standing or growing upon said lands shall be relieved of annual taxes and shall pay only the stumpage tax on the products when cut.

10. That an account shall be opened with each owner of land having standing timber whose value has been assessed for taxation, on which shall be entered, the assessed value of standing timber, the value of the stumpage upon which a products tax is paid, and the rate and amount of the tax. Whenever said value shall equal five per cent. of the assessed value of the timber, a reduction shall be made in said assessed value equal to value upon which tax has been paid, and the annual taxes shall thereafter be assessed against said reduced value.

The purpose of these provisions is self-evident. They are to secure a complete or universal adoption of the law within a reasonable time and with minimum cost and effort and least injustice.

It is made an object to timber owners to list the timber values, as by doing so they secure a fixed value on this portion of their property and protection from increase in total assessment for three years; namely, from any action on part of assessors to nullify the effect of listing timber values by simply adding said values to value of the property. They also secure a definite procedure by which said values can be extinguished by payment of products tax. It is to their interest to declare full values, since this is bare land on which taxes will be continued. Failure to declare any value permits and justifies the continuation of correspondingly high values on the only portion of their assessed value which can subsequently be so extinguished. Failure to declare value, or declaration of too low a value permits the assessors to determine new value at any future time, both for land and timber, while declaration of timber values confines them to revaluation of the land without timber, on the assumption that existing values having been the basis of taxation when the law was passed, shall equitably remain the basis of taxation of the timber.

The public interests on the other hand, as represented by the assessors, are thoroughly protected. The total assessed value is in no case reduced. After three years, the value of the land can, if equitable, be reassessed, and within the requirements of the statute, be further adjusted. The loss of annual taxes does not occur unless timber is cut, when they should in any case cease, and the increasing value of young timber and old stands is taxed by a products tax.

Failure to declare and pay the products tax on old timber carries its own punishment in that the timber although cut, will continue to be as-

sessed and taxed annually. By the time the products tax on young timber assumes large proportions, the machinery for securing its collection would be in good working order.

Owners of wild, unimproved or cut-over lands, under this system, will pay on the same assessed valuation as those who have left seed trees, young timber and have planted or secured natural reproduction. Although the latter property will constantly increase in value as the result of forestry, there will be no increase in taxation which is not imposed equally upon unimproved wild lands. Yet these forested lands will eventually bring in the additional revenue of products taxes, besides furnishing employment and raw material for the wood-using industries.

Unless the public is willing to agree in advance to such a plan of taxation for timber, no such inducement or guarantee is offered for proper management, instead the owner of young timber may be certain that the assessor will raise the value of such lands because of his industry, long before the trees can be cut, and by the time he can sell his crop, taxes and interest will have absorbed far too great a part of his expected income.

If there is anything unequitable in this universal but gradual substitution of a products tax for the present property tax on standing timber it does not appear on the surface.

I promised you this would be a dry subject and now you see that I was right. (Applause)

MR. BOOKWALTER: I now take pleasure in presenting to you Mr. Wilson Compton, who is secretary-manager of the National Lumber Manufacturers' Association. His subject is the "Economic Aspect of State Forests." (Applause)

MR. WILSON COMPTON: Mr. Toastmaster, and ladies and gentlemen of the Tri-State Forestry Conference.

Governor Lowden, in his recent statement that the chief need, not only of this country, but of the whole world is "economic equilibrium" has furnished a slogan which is peculiarly pertinent to the public problem with which three great states, in this conference, are grappling. Equilibrium implies a balancing of opposing forces. In the world at large this economic balance will be accomplished only through a general increase in the production of useful commodities and by a readjustment of consumption whereby there shall be more of the necessaries and fewer of the luxuries, until normal human activities throughout the world shall have been reestablished.

The supply of useful commodities must be made more adequate to meet the demand for them upon such terms as will enable all persons who will work, to have a fair share of the fruits of their labor. A condition of production and distribution, entirely out of normal equilibrium, is primarily responsible for the prominent place in the news of the day which is occupied by the activities of misguided men, who, by only a wave of the hand would accomplish a social state which the experience of the human race has indicated can be accomplished only through centuries of gradual evolution and development.

The forests have had a large share in the world's industrial activity, and will in the future contribute largely to the accomplishment of economic

equilibrium. The effort of the states of Ohio, Indiana and Illinois to establish a plan for their forest lands, consistent with the larger needs of the nation is a timely one. It is appropriate that search be made for the basic principles which must underlie such plan if it is to have promise of permanence. For pride or sentiment or opinion should not, and in the long run, will not prevail against fact, or against the fundamental economic laws upon which industry and commerce have been built, the world over.

Abundance and variety of natural resources have constituted, perhaps, this nation's strongest claim to industrial and commercial prosperity. Waste is national folly. Conservation is a guarantee of national life.

About half a century ago the congress of the United States became much exercised over the alarming prospect for the nation's timber supply which was then said to exist, a prospect which would within forty years, it was stated, leave the United States bare of its great forests. For some years thereafter senators and congressmen endeavored to save the forests by making speeches about conservation. Then a Division of Forestry was operated to find out what was becoming of the trees. Today its powerful successor, the United States Forest Service, is itself the administrator of more timber in the national forests than congressmen fifty years ago thought there was at that time in the whole of the United States. But the spectre of the "timber famine" still stalks.

Essentials of a State Forest Policy. The forests, in addition to providing raw material for the manufacture of lumber and other commodities of almost universal use, have a more or less remote relation (a) to the control of water flow; (b) to soil fertility; (c) to the pleasure and recreation of the people; and even, it is often asserted, (d) to climatic conditions and the public health. The chief concern of forest conservation is, however, the adequate future supply of those useful commodities which are secured through the industrial uses of the standing timber, especially through manufacture into lumber. A determination of the economic position which state forests occupy in a consistent plan for the forests of the nation as a whole, would involve the answer in the light of all the complex conditions in American industrial life, to the following four questions:

First, how much standing timber is needed in the United States?

Second, what species of timber should be replaced and perpetuated in the forests of this country?

Third, how, geographically, should these forests be distributed?

Fourth, who should grow and own the forests?

Quantity, quality, location and ownership! These are the essential questions which confront Ohio, Indiana and Illinois, and indeed all other states, in their effort adequately to meet the needs of their people for the products of the forest.

How Much Timber Is Needed? The permanent needs for standing timber cannot of course be ascertained with mathematical precision. The future is inscrutable. The public requirement for lumber and for other forest products cannot be determined separate from the supply of other materials having substantially similar uses. An accurate determination of probable future forest needs would require a nation-wide survey of the whole arena of industry and of the supply of all the materials which may

be substituted for wood. But such a determination would itself be only provisional. Lacking even this information perhaps the most trustworthy evidence is to be found in the experience of other nations at the same relative stage in industrial development as we are now experiencing in the United States.

It is undeniable that this country is today, and heretofore always has been, using up its forests more rapidly than they have been replaced by regrowth. When timber was plentiful and cheap, and industrial development in comparative infancy, wood was of course, freely used. In many parts of the United States before the war the average annual consumption per person of lumber and wood products, not including firewood, was equivalent to more than two thousand five hundred board feet. In the state of Montana an agricultural and mining community it was about one thousand two hundred fifty feet; in Oregon, seven hundred twenty feet; but in Pennsylvania and New York, industrial states, only three hundred feet and two hundred feet respectively. In the United States as a whole the consumption of lumber per person is now approximately three hundred twenty feet, as against more than five hundred feet less than fifteen years ago and one hundred feet in England, ninety feet in France and one hundred fifty feet in Germany immediately prior to the outbreak of the war.

Industrial evolution has, in the history of nations, been accompanied by a decline in the wood-using customs of the people. While Americans will, of course, desire for this nation, always a larger inheritance of national resources than other less favored peoples have possessed, it is likely that the same drama of changing lumber requirements will be enacted here. It is improbable that the annual production of lumber in this country will for any substantial period, if ever again, exceed forty billion feet. Last year it was less than thirty-two billion feet. Ten years ago it was forty-five billion feet. Increases in population will probably be offset by reciprocal changes in the wood-using customs of the people.

Exports of lumber are not likely to absorb the volume of timber which many glittering reports from abroad may have indicated. The export trade will undoubtedly increase—and it should. But the nations in the greatest need of materials for construction are so thoroughly committed, through tradition and sentiment, to the use of other materials such as brick and tile and stone, that the predicted avalanche of demand for American lumber is in doubt.

Were a permanent forestation enterprise established in this country on the basis, for example, of the system used successfully in Sweden, on a one hundred year period of rotation, a supply of merchantable standing timber of two trillion feet with a proper distribution of age classes, would probably be adequate reasonably to meet the needs which may be forecasted. We have today according to present standards of estimate, nearly three trillion feet of merchantable timber most of which is relatively mature. Roughly speaking therefore there is a "slack" of nearly one trillion feet. Supplemented by probable new growth of not less than three-quarters of a trillion more, this supply should last approximately fifty years. During this period provision will have been made for making the remaining two trillion or its equivalent, self-perpetuating, or else "timber shortage"

will have ceased to be a threat and will have become an accomplished fact.

So much then for the quantity of standing saw timber permanently needed in this country—approximately two trillion feet of distributed age classes, and about half a century to accomplish the proper distribution.

Even with the additional provision appropriate for woodlots and other acreage furnishing fire-wood, posts, poles, and miscellaneous wood products, it is apparent that, in this country as a whole, there is enough mountainous, rough and waste land, wholly profitless for agriculture but suitable for forestation, to supply its permanent timber needs. Fortunately therefore an adequate forest policy need not, at any point, conflict with an equally wise national policy for agricultural and general industrial development.

What Species of Timber Should Be Perpetuated in the Forests of the United States? But in the definition of forest policy, the determination of necessary quantity of timber is not enough. Of equal importance is the selection of species and quality.

If nature, unaided and undisturbed, were to be the universal regulator of all economic and industrial processes, then doubtless, in the long course of time, most if not all of the species in the original timber stands would be replaced by natural re-growth. There have been more than one hundred different species of American woods having substantial commercial uses and nature if given a fair chance, would in time replace nearly all of them. Northern Ohio and Indiana would have some softwoods; the Miami Valley would have fine walnut; the southern counties at the big bend in the river would have big sycamores. Ohio, Indiana and Illinois would all have great forests of oak, elm, ash, hickory and a generous mixture of scores of other species native to their soil.

But is that what we want when we plan a permanent forest policy? Is it necessarily true, because gum trees are native to Ohio soil, that the replacement of gum should be encouraged? Or, because woodworking industries established in the state have been using hickory, that forests of hickory should be replaced in Indiana?

Conceivably might it not perhaps be wiser and more profitable for those in Ohio who want gum to get it from Arkansas and Tennessee where it grows to better quality? And for those wood-using industries of Indiana which have been accustomed to use hickory, to learn to use, if possible, ash, or elm, or other species of more rapid growth but having appropriate physical properties.

These are only illustrative of an important principle, namely, that within substantial limits, the peculiar industrial advantage of using a given species of wood may be outweighed by the advantage of using a species of timber that can be regrown more quickly and at lower cost.

For commercial purposes it is well known many species are readily interchangeable. Practically the same useful things that have heretofore been made from more than one hundred commercial species of hard and softwoods may be made from ten different species wisely selected. Where there is substantial similarity in physical qualities and virtual equality of fitness for given industrial uses, those species should be perpetuated which can be grown to commercially useful size in the shortest time at the lowest cost. The entire elimination from the forests of Ohio, Indiana and Illinois

of many of their native species, provided adequate substitutes were preserved, would therefore involve no necessary impairment of the welfare of their industries or of their people.

In the administration of the permanent plan of forestation there should be interference with nature sufficient at least to secure the perpetuation of the species which are economically the most useful and to secure the elimination from the commercial forests of other species less useful and more expensive to reproduce. Perhaps we have not always given adequate consideration to this principle of selection of species in the effort to provide a permanent future supply of timber for the wood-using industries of these states.

How Geographically, Should the Forests Be Distributed? The third great factor in the determination of the economic position of state forests is their geographical distribution. If it may be assumed that the lumber requirements of the nation will be adequately met by a volume of growing forests, with properly distributed age classes, sufficient to yield during an estimated average one hundred year period of rotation a total of four trillion feet; and assuming that the forest lands on the average for both softwood and hardwood will yield ten thousand feet of mature timber per acre, not more than four hundred million acres under permanent forestation will be required. This is about one-fifth of the land area of the United States and is approximately twice the area of the present public forests, national, state and municipal.

Less than one-fourth of the total land area of the United States is now in improved farms. About one-fifth more is attached to farms but is unimproved. Nearly one-fifth is at present arid waste land useful for neither agriculture nor forestation, much of it capable of reclamation by irrigation. There is available, therefore, land sufficient to support a great expansion in agricultural activity and to provide fully for future forest supplies.

The softwood forests will probably be located in the mountain regions of the west, east, and south, the sand plains of the lake states and the lowlands along many parts of the Atlantic and Gulf coasts. The hardwoods will perhaps be confined largely to the southern Appalachians, rough country along the Ohio river, the middle and lower Mississippi and their tributaries, to some of the uplands of the lake states and to the farm woodlots which are characteristic of the agricultural enterprises in the central states and the middle west.

Forest policies by states individually or by groups are formulated under a substantial handicap because of their lack of control over the policies and activities of other states. No single state can intelligently determine how large its forests should be, what kinds of timber they should contain, and on what lands they should be located without giving consideration to the policies of neighboring states and of the nation at large. The products of the forests are sold in interstate commerce which ignores all state boundaries. A centralized control over the forestry activities of all the states would make practicable a national forest policy that would secure the most efficient possible adaptation of the quantity, quality and location of the forests to the needs of the industries for which they must continue to provide the raw material. If state lines do not determine the markets

for the finished product or the channels through which they may be sold, neither should they determine the character, or the distribution of the raw material—the forests themselves.

This local handicap to state forest policies is important but it is not decisive. Each state individually may, in the formation of its plan, as you yourselves are doing here, recognize the need not only of an understanding with its neighbors, but also of co-ordination with the larger plan for the forests of the nation as a whole through a powerful federal agency, such as the Forest Service.

Who Should Grow Forests? Finally arises the question: Who should grow and own forests? Considerably less than two million acres of forest lands is today publicly owned, and some of that is not in timber. Probably more than two million additional acres now in private holding will be required as a permanent source of timber supply to the nation. May private enterprise be counted upon to provide this raw material for the distant future use of American industries? I do not think so. Men who have bought timber and built saw mills are foresters and interested in a business way in the perpetuation of the forests only in the same sense and to the same degree that coal operators are geologists and interested in the perpetuation of the coal supply. The business of the lumber manufacturer is to make boards out of the trees which he already owns, not to make more trees out of which some one else some day may make more boards.

By fortuitous circumstances he is usually an owner of cut-over land. This land may be the most useful for permanent forestation, but the ownership of such land does not put the owner under obligation to engage in a reforestation enterprise unless he elects to do so. He will not, and he should not, in the public interest, choose to reforest his lands unless to do so would be a profitable enterprise. Even effort, misguided though it is, to compel through legislation, reforestation of private logged-off lands, such as has been not infrequently proposed, will not avail against the economic laws which direct everywhere men's industrial activities. Such legislation would secure, throughout the country at large, not a replacement of the forests through private enterprise but instead a wide-spread reversion to the state of the private lands thus designated for reforestation. Legislation making private forestry compulsory, irrespective of its profitableness or its prospect of profit would produce therefore not *trees*, but substantially the *confiscation* of the land upon which it was intended that the trees should grow. But a "*forest* policy" that does not produce *forests* is not a forest policy.

Private enterprise is notably not suited to undertakings which do not bear fruit for from fifty to one hundred years and it cannot wisely be counted upon to provide a substantial future supply of standing timber, of which large size and superior quality are essential. In the case of spruce for pulp manufacture it is possible that private enterprise may be relied upon because the period of tree crop rotation is relatively short and size and quality are by no means such important factors as they are in the case of timber for use in lumber manufacture.

Similarly softwood timber of some species on southern lands frequently reaches merchantable size within forty years. But this is not true of the

hardwoods nor of the softwood timber that will produce wide, clear lumber or large dimension timbers.

The Position of the State Forests. For the reforestation of the inferior grades of softwoods private enterprise may be adequate. But for the perpetuation of the superior grades of softwoods and of the desirable hardwood species, such as are native to the soil of the Ohio valley, no adequate provision will have been made until state forests or federal forests shall have been established for that purpose. The hardwoods are of peculiar concern to the states of Ohio, Indiana and Illinois. But there can be but little prospect of permanent success in their forest enterprises until these states shall have committed themselves definitely to the establishment and maintenance of state forests, and these not as an experiment, but as a business.

The quantity, location and species of timber with which the appropriate lands of these states should be reforested can wisely be detemined only in relation to the policy which may be established for the nation as a whole. State pride might encourage us to seek for our own industries and our own people, comparative independence of the sources of timber supply outside the state. But it is not impossible that the interests of these three states may be permanently best served if the bulk of their future supply, for example, of oak lumber should come from West Virginia or Kentucky or Tennessee. There is essentially no greater reason that Indiana should supply her own people with oak from her own forests than that Nebraskan homes should be built of "Nebraskan pine", provided that the land, the labor, and the capital which Indiana would have devoted to the growing of oak timber could have been directed more profitably into other lines of enterprise.

The test of true conservation is not therefore in the size of the forests, or in the quality of the timber standing therein, but in the fitness of the plan of forestation to contribute to the most efficient possible utilization of the state's resources of land and capital and to the most profitable application of the labor of its people. "Conservation" of any other kind is not conservation, but waste.

The specific forest needs of the three states of Ohio, Indiana and Illinois, cannot, it is true, be determined by the total forest needs of the entire nation, but they can be largely guided by them. Although timber generally is still plentiful there is a growing scarcity of a few important species which may properly cause concern to our industries and people. The fertile lands of the Miami and Wabash valleys once carried the finest walnut and oak forests in the middle west. Today the same lands produce the finest corn crops in the Ohio river valley. Fifty years ago pioneer farmers in southern Ohio were having neighborhood "log-rollings" at which they burned millions of feet of black walnut trees like those for which the War Department during the war literally scoured the country to find material for gun stocks. The heavy hewn beams of the old barns in the Ohio valley are of wood that now makes table tops for kings and many an old granary door would make fine furniture.

The industrial life of these states is today in their farms and pastures, their packing houses, canneries, steel works, refineries and factories. Their

prosperity is largely due to their farms, and agricultural development would have been impossible without the sacrifice of the finest of their forests. Nations and states, like individuals, cannot "eat their cake and have it, too."

Now, we are endeavoring to reclaim a part of this lost heritage of forests. Removal of timber and the rapid vanishing of nearby sources of supply are focusing public attention more and more upon the need of prompt and systematic provision for the future. There is enough time but not too much, in which to put forestation in the United States upon a sound and permanent basis. But there will be no definite or assuring accomplishment until the nation and the several states themselves shall have assumed this obligation as their own.

The fertile valley lands of the Ohio, the Wabash and the Miami have figured prominently in the agricultural development and the industrial prosperity of the central west.

In the great joint forestry enterprise which you are here planning the hill lands may be reclaimed. They too may help to make this prosperity secure and permanent and the forests on the hills in the big bend of the Ohio river may yet become a factor in the industrial life of these states as vital perhaps as the farms on the banks of the Wabash. (Applause)

MR. BOOKWALTER: I take special pleasure in presenting to you Professor Rothrock of Indiana University, who will address you for a few moments. (Applause)

PROF. ROTHROCK: Mr. Toastmaster and gentlemen, I am not a forester at all, I know very little about forestry, although I would like to know a great deal more. This matter appeals to me in a personal way. I like to see things saved and it seems to me that our forests are well worth saving. Perhaps we can take steps at this conference that will lead into something, so that the future legislature will give us more authority in the conserving of forests. (Applause)

MR. BOOKWALTER: A meeting of lumbermen or any industry connected with the lumber industry held in Indianapolis would not be complete without a few words from Mr. Barnaby, of Greencastle. (Applause)

MR. BARNABY: It has always been that saw-mill men have been blamed with misusing our forests. I am sure I don't know why it is, because we only use the lumber as necessity demands. But I am glad to see this company of men so alive and interested in forest conservation. I have been attending lumber conventions for something like thirty years and at their annual meetings we always hear from some forestry man, and while he is talking, everybody goes to sleep. I don't know why they don't become more interested, but they don't seem to. They need a bunch of men like you to get them stirred up. The need for conservation is growing daily more and more apparent. Right now there is a great demand for white oak and we are having difficulty in getting all that we need. The men who manufacture material from white oak are at a loss to know where their future supply is coming from.

I don't know how we are going to get the people of our country aroused but I think it is up to the nation as a whole as well as the states. I don't believe that the individuals alone can do it. (Applause)

MR. BOOKWALTER: It is not our desire nor purpose to draw out this program to a tedious length, but I think that even though you have the opportunity of hearing from him tomorrow, that we would like to have just a few words from him now. He is the man whom I consider to be the most useful citizen of this capital of Indiana, a man who has always unselfishly worked for the betterment of his home town. It is to me a great personal pleasure to present to you for just a few remarks, Mr. Richard Lieber, of this city. (Applause)

MR. LIEBER: Mr. Chairman and gentlemen, this evening I was so happy as I sat here quietly in the background and listened to the papers that have been given. I have been thinking of the times that I have had to sit up there at the speakers' table waiting for my turn to come, and waiting to get out of my system the paper I had been asked to give and now our toastmaster asks me to speak. I hope this is as far as we will go.

I am reminded of a little incident which I witnessed when I was a young man living in England. It had been raining for several days when one night it turned cold very suddenly. The next morning the streets were extremely slippery, a serious matter because of the hilly country. As I was watching, an old gentleman from across the street started out very carefully, picking his way along on icy pavement. He was getting along very nicely until a young person came out, paying no attention to the change and started down the hill just behind the old man. Very suddenly she slipped and the next I knew they were both rolling down the hill together and when they reached the bottom, she was found sitting on top of the old gentleman. He said, "I beg your pardon, madam, but I presume you will have to get off; this is as far as we go." (Laughter and applause)

MR. BOOKWALTER: Well, Mr. Lieber, this is as far as we will go tonight.

ADJOURNMENT.

THURSDAY MORNING SESSION

The meeting was called to order at 9:30 A. M. with Senator Guthrie presiding.

THE CHAIRMAN: It is far past the hour at which we were scheduled to begin this morning, so I think we had better come to order. We have a lot of work to be done this morning. I am going to ask all of you to take particular notice of Mr. William's paper and I hope you will be able to remember the points he makes. I take it that we had better go right through with the program and carry it out as it is. We will first hear from Dr. C. E. Thorne, Director of Ohio Agricultural Experiment Station. (Applause)

MR. SECREST: I regret that Mr. Thorne could not attend the conference and present this subject to you. It was impossible, however, for him to be here, and he has requested me to present to you an outline of what we think should constitute our program of forestry for Ohio.

The maintenance of the forests concerns the public interests as well as those of individuals who are directly dependent in some manner upon

wood as a source of raw material. The various functions of forests are so vital to the welfare of a state that their depletion cannot be permitted to longer escape the attention of the public.

Private ownership in the main has failed to provide for the renewal of the forest after cutting. The timbers of commerce have continued to come largely from the original forest growth. The second growth available for use is meagre, and results from a let alone policy rather than any effort on the part of woodland owners to produce a second crop to succeed the virgin growth. The total available saw timber in the state does not exceed 1,100,000,000 feet, and this is by no means first quality material. The wood using industries dependent upon hardwoods are rapidly absorbing the limited stumpage, and they will soon be compelled to shut down or go elsewhere. The consumers of hardwoods are finding good grades increasingly difficult to obtain and at higher prices. The hardwood timber supply is limited in this country as compared with that of softwoods, and the sources of first growth material from the states that now have a reserve will soon cease to exist.

The effect of forest depletion upon communities within the inherent timber section of the state is also serious enough in consequence to engage the attention of the public. Small centers of population which within the last few decades were dependent to a considerable degree upon a livelihood derived from the various factors of the lumbering industry are no longer able to enjoy the modest prosperity which was theirs. Since the passing of the merchantable timber many small towns and villages have lost an important source of income, and the reaction is reflected in depopulation, vacant houses and abandoned wood working plants. Nor is this alone the only loss to communities and the commonwealth. The depleted forest lands of no practicable utility aside from timber production, after having been stripped of all merchantable growth are permitted to become devastated by fire, thus further reducing their usefulness by destroying even their potentiality. Such lands, and there are several hundred thousand acres in Ohio, can hope for little development by virtue of private ownership under present existing conditions, and there must be a material change in economic conditions and in governmental regulations before private capital will undertake forest renewal.

Those who have been in close touch with the forestry situation in Ohio are of the opinion that the state must adopt a policy in which positive steps are taken to maintain and perpetuate the forests now existing on inherent forest soils and to provide for reforestation where needed on non-agricultural or idle lands, and that this must be done in a manner that will accomplish the purpose with the least possible delay. The program proposed for Ohio is believed to embrace the greatest needs at the present time and it may be modified or supplemented as future conditions warrant.

Publicly owned forests are undoubtedly a basic factor in a program for increased timber production. The public through state, county and municipal government, is the agency that can best take over cut-over and wild lands and provide the necessary protection and maintenance for the production of successive crops of timber. Nor is this a problem of the production of timber only. It is economy for the state to utilize all land to its

fullest extent. Productive land adds to the wealth of a community and state by direct and indirect means. Idle and wild lands are a liability.

Again the function of state forests would be extended to other purposes of utility. They would serve to protect stream flow and the maintenance of navigable streams. The proposed public forests for Ohio are in a section of broken topography and in close proximity to the Ohio river.

The state needs, furthermore, publicly owned forests for natural recreation grounds. There are virtually no places existing with proper facilities where citizens of Ohio can secure camping and outing privileges, other than those under private ownership. Trespassing and going onto another's land even with permission is not attractive to most people. State forests with appropriate camping sites would attract people to them. It would add to their usefulness and would serve as a means of education in the aims and purposes of forestry, and would gain support for a policy of forest conservation.

Ohio has approximately 500,000 acres of land which should come under public ownership, at least until economic conditions warrant returning all or part to private ownership under a guarantee of the continuance of sustained yield forests. Our present program contemplated the acquisition of 200,000 acres of cut-over and wild lands in some of the southern Ohio counties. Such purchase would not entail a contiguous area, but would comprise several tracts. A recent detailed survey of Scioto Co. indicates the possibility of acquiring some 75,000 acres in virtually a continuous body. In any case the proposed total acquisition would be so grouped as to render administration easily and economically applied. Authority to purchase lands for state forests was conferred upon the Board of Control of the Ohio Agricultural Experiment Station and sufficient appropriations secured to make a beginning, although the two tracts purchased are devoted to experimental and demonstration purposes. An effort therefore must be made to procure adequate appropriations or bond issues to carry out the purchase program as adopted.

Municipalities can and should take part in the program of forest conservation. There is ample opportunity in Ohio for a considerable number of cities to acquire lands on broken topography suitable for forests, contiguous or in close proximity to the corporate limits. Such tracts would often be partially wooded with native forest, and would require no great amount of artificial forestation. These areas could be converted into natural parks for the benefit of the urban dweller, and at the same time be a factor in timber production. While requiring a monetary outlay at the outset, municipal forests could ultimately be made to pay their way, and in time yield a revenue. It would be well for the people of cities to contrast the usefulness of the relatively inexpensive municipal forest with some of the ostentatious and freakish parks that adorn some of our cities. Ohio now has two city forests, those of Oberlin and Cincinnati.

Other political subdivisions such as counties and townships should also be authorized to acquire forests or forest parks. In this connection there would be the opportunity to preserve certain forested scenic features.

Forest protection is coextensive in importance with the acquisition of publicly owned forests. An adequate system for the control and suppres-

sion of forest fires is needed in certain counties of the state. Fire injury of any consequence exists only on the inherent forest lands of large contiguous holdings. The smaller bodies of forests, mostly farmers' woodlands are rarely damaged by fires. Legislation will be needed and will be requested for putting into effect the necessary machinery for fire protection where needed in southern Ohio.

Grazing of woodlands has become a fixed habit with the farmer, and in general is unprofitable since woodlands are poor pasture, and pastured woodlands are poor forest. A campaign of education has been directed against this practice and it is believed has accomplished some result. It is probable that this problem can best be solved by educational means. Fortunately grazing is more prevalent on the woodlands of the better agricultural sections of the state, where land is high priced and the woodlands will soon give way to farm crops. Granting the realization of the purchase program of such areas as are practicable for public ownership, the bulk of the forests of the state would still be in private hands. Greater assistance to the owners of woodlands by the state by means of definite advice, more comprehensive working plans, fire protection, equitable taxation, adequate research in forest problems, will avail much to promote the practice of private forestry, but it is altogether probable that it will not meet the needs. Indeed this doubt seems to be well founded in the experience of the states which have had seemingly well established policies for sometime.

Definite assistance where the public assumes the financial burden, the attendant risks through the long period of time in carrying the timber crop from the beginning well along to maturity would seem to be required if any general results are obtained. We are inclined to favor, therefore, that upon application of the owner of certain classes of timberland the state take over the land and take charge of the renewal of the forest and its management, the cost to be charged against the owner, and is to be a lien against the timber. The burdens of taxation, fire risks, long time investment, etc., could thus be assumed by the state and at time of final cutting, which would be under the supervision of the state, the cost charges would be obligated by the owner. The owner, however, should have the option of discharging the obligation at any time upon payment to the state of the accrued costs of reforestation and administration together with a conservative rate of interest. A plan somewhat similar to that above has been in operation in Massachusetts for some years, and though it has apparently been limited to the artificial reforestation of idle lands, has been quite successful in operation. It would seem that if the plan could be extended to second growth and cut-over lands, partially or fully stocked as well as to purely planting projects. its usefulness would be greatly extended.

Artificial reforestation must necessarily be given considerable prominence in any forestry program. This phase, however, is of minor consequence as compared with the renewal of the native woodland through natural regeneration. The areas wherein planting must be done, however, will increase rapidly unless steps are taken to protect and maintain the native growth or inherent forest soils.

The state should give encouragement to private owners in planting waste

and idle lands, shelterbelts, etc. To this end it should be prepared to give assistance which will promote the most economical formation and successful development of forest plantations.

The state should establish forest nurseries where planting stock is grown in large quantities and could be distributed to landowners free of charge or at a cost not to exceed cost of production. Forest nurseries are now maintained but the output is not sufficient to furnish any large quantities of stock.

Forest utilization and marketing of forest products are important features of an adequate forest policy. Economy in the use and disposal of timber has a definite salient influence on the conservation of merchantable timber. The Ohio Department of Forestry has given attention to these problems, and has established a service by which woodland owners are given assistance relative to timber estimates, values, methods of logging, marketing, etc. There should be co-operation between woodland owners in marketing timber. It would enable them to dispose of their different grades of timber to better advantage, and would often prevent waste and misutilization of grades.

A land classification is now in progress and it should be pushed to completion as rapidly as possible. By this means it will be possible to determine the amounts, classes and location of lands suited to forest production. Along with land classification a survey of the present forest resources should be made, comprising the present supplies and the future potentialities.

The needs for more extensive and better organized research work would be evident in putting into effect the program as proposed. There is virtually a virgin field in forestry for research work, and more definite knowledge of certain phases of forest production and utilization would undoubtedly lead to an earlier realization of a workable and satisfactory forest policy.

We have not proceeded as fast as we would have liked to, but I am not discouraged. The outlook for some real accomplishments in the near future is pretty bright. The war has had a good effect and I feel that we are going to get something done that will be worth while. (Applause)

THE CHAIRMAN: I have been particularly interested in what Mr. Secrest had to say because conditions in Ohio and Indiana are practically the same. I think that Ohio has much larger tracts of timber than Indiana has, but this will be interesting when the discussion comes up as to how we are to acquire the timber lands.

The next speaker to appear is Dr. F. W. Shepardson, Director of Registration and Education. Dr. Shepardson will speak of Illinois state forest policies. (Applause)

DR. SHEPARDSON: The representatives from Illinois to this conference came to listen rather than to talk, to learn rather than to teach. Our program in Illinois for forestry is just tentative; our policy—we have none. We have not done as much as Ohio and Indiana, and I am afraid that hitherto we have not been much impressed with what either of those two states has done, as it has been unfolded here in the meeting of this conference.

If I were to stop there, I should certainly do injustice to Illinois. Because there are some things that we have done which ought to be brought to your attention. These things, to my mind are hopeful, especially in view of the prevailing sentiment that the three states along the Ohio river have more or less common interests.

When I was appointed to my present position, I had no idea what I was expected to do. I found among other things that there was to be a Board of Natural Resources and Conservation. That title appealed to me. It had vision, and seemed to imply that the state expected that something was going to be done in conservation line. I studied the make-up of that board. There was an expert in geology to co-operate with the state in the geological survey. There was an expert in natural history. There were experts in chemistry and sanitation. There was an expert in forestry.

The next question came as to whether Illinois had accomplished anything along the lines of forest preservation. It was found that in May, 1893, Mr. G. W. McCluer in connection with Professor T. J. Burrill of the University of Illinois made a report on forestry in Illinois. This is an extremely interesting document. In a general way he showed that there are eighty species of forest trees in Illinois besides many large shrubs. The first appropriation for forestry was made on March 11, 1869, one thousand dollars being set aside for trees and seeds. Experimental planting was begun by the University of Illinois in the spring of 1871. This report is found in Bulletin 26 of the Agricultural Experiment Station at Champaign. Its general conclusions are that the land in Illinois which was fit for wheat and corn was too valuable to be used for forest trees; that well timbered land sold at a less price per acre than adjoining lands that had been cleared or than prairie land of the same productiveness. The value of the timber was less than the cost of clearing and bringing under cultivation. The report continued, that, apart from economic views, the planting of trees had higher and other claims for consideration. These included the equalization of temperature, the better distribution of moisture, better sustaining the running streams and minimizing and reducing the danger of destructive floods, the checking of heavy winds, the better protection of the crops from the destructive influence of air moving too rapidly, and the aesthetic value of trees used as ornaments.

On May 5, 1903, a resolution was adopted in the state legislature lamenting the diminishing of the forest area of Illinois and asking that the Department of Agriculture of the United States of America be requested to make an investigation as to the condition of the forests and to make recommendations for preserving what remained and for encouraging the propagation, growth and protection of forests in general within the state.

In 1910 another study was made in co-operation with Mr. Peters by two representatives of the forest service, this report being published in 1911 under the title "Forest Conditions in Illinois." The survey which was made was thorough so far as it went. The report shows what various kinds of trees were to be found in Illinois and it was illustrated by photographs which brought out many points of interest.

Nothing else seems to have been done until the adoption of the Civil Administrative Code. This provided for a Board of Natural Resources and

Conservation to advise regarding the scientific work of the state, forestry being mentioned as one specific phase of it, this to be represented on the board mentioned by an expert on the subject. Under the direction of this board, Professor John M. Coulter, the expert in forestry, was instructed to present a report on possibilities along this line. As a result of his recommendations which followed some investigational work by graduate students under him, the Board of Natural Resources and Conservation recommended that a forester be employed to make a preliminary study of the needs and possibilities of the situation. An item was included in the budget of the Natural History Survey to provide for the salary of the forester whose work began July 1st, 1919.

Now I think I have recounted the history of forestry in Illinois. I want to call attention to the fact that we have in the vicinity of Chicago, in Cook county, forest preserves, that have led many people to think seriously of this question of forestry, and of the desirability of preserving trees.

As we look forward, what is the situation? The first thing we did was to ask the legislature for an appropriation to start something and they did give us a small amount which we plan to use to make a survey which will reveal in printed form the various conditions which have been discussed in this room during the last day. We hope to use this for the purpose of stimulating interest in preserving the forests of Illinois. We want to be able to provide valuable information so that at the next session of the legislature, we may be able to get a larger appropriation and then really start work as it should be started. We have made the right kind of a beginning. We gave careful consideration to the kind of a man we should have for state forester. We found one who pleased us and with whom we are increasingly pleased as the days go by. He is working under handicaps of not having enough help in men or money, but he has made a good beginning. Now then, the question is, what can we do in the future? There again we come to some peculiar conditions which confront us. Illinois is in the midst of a big undertaking—we are now trying the budget system. If there is a legislative body which knows nothing of the relation of income to outgo, it might easily be induced by argument to make an appropriation of a hundred thousand dollars for forestry purposes, but you can't get by with this and the budget system.

We can't get an appropriation unless we can show that we can actually give something that will benefit Illinois. This applies to forestry or anything else. We are now at work on a good roads program which will cost us over a hundred million dollars. Not only the roads which the state is building, but those of local communities, are being reconstructed. We are undertaking a great waterways program in Illinois, and an investment of a good many million dollars is going into that, not only for tomorrow but for the future. We are engaged in making a topographical survey of Illinois, in co-operation with the United States Government. We have just completed about twenty-three per cent. of the map making. We want to publish that just as fast as we can. Incidentally, we have started a little bit of work along drainage lines.

All of these things are working favorably toward forestation, because people are being united as they never were before. We have begun to

realize that Illinois must do things as Illinois, and not as sections of a state. We are already co-operating with the Federal Government in the topographical survey. In this map-making the ground is being prepared. There is this background for study and thought. There have been papers prepared, relating to various minor features of forestry. There have been small groups of people interested in this thing. And now I come back to where I started, saying that the forestry program of Illinois is still tentative, and as for a forest policy, we have none. I believe I am also justified in saying that Illinois is working on a lot of things which are preparing the way for us so that if Ohio, Indiana and Illinois get together, working with the Federal Government, doing those things which can be done, Illinois will be ready to co-operate, and Illinois will lend its influence, not only in the halls of congress, but also at home. (Applause)

THE CHAIRMAN: We have all been interested in Dr. Shepardson's talk, and I know it will bring out much discussion when we come to that point. It interested me, because he admitted that we were ahead of Illinois in forestry. All of you are aware that Indiana made some changes in the last legislature, and created a Department of Conservation, which covers five or six different offices, listing them under this board. After the Government created this board, which was to commence action the first of April, the board thought only of one man as director of these departments. He was a man who took great interest in parks, conservation, had spent a good deal of time and money along these lines, and so we selected for this position a man who will talk to you now, and who no doubt will give us something which will be appreciated, Col. Richard Lieber, Director of Conservation for the State of Indiana. (Applause)

MR. RICHARD LIEBER: Mr. Chairman and gentlemen, at the banquet last night Mr. Bookwalter referred to an accident which happened to a lonely tree in France. That to us, sounded like a strange incident for nobody in this country has ever thought of planting trees for the future since everybody expects that the remnants of forests that we do have should last forever and so save us from the necessity of exerting ourselves. Whereas in the old countries of Europe tree planting has become a necessity and has been practiced for centuries, we are now just in the early stages of considering it. It is not that we are less careful than the other nations, not that the other nations are wiser than we are, but it is because necessity has not yet driven us to it. As matters are shaping up at this time, we still have a margin of safety, but is it always wise to use the margin of safety? We should be prepared to have that material which is so essential, therefore the entire matter of forestry is one of public interest.

The forestry problem of Indiana must be solved on the basis of public welfare. Under this I would include such contributing factors as the aesthetic, climatic, recreational and most important, the economical.

All these elements are contained in the wider scope of a forestry policy and so interwoven are they into the public weal that it is doubly necessary to work out a well defined, at times even a narrowed down, plan of forest management in order to keep its character free from confusion with its attributes.

The silent woods may be the poet's inspiration, but that is not forestry.

The white-tailed deer which I hope to see reinstated in its former domain may again give joy to the nature lover and to the sportsmen, but that is not forestry. Winding roads through inviting woodlands over which travels in super-limousines or in the well-known and popular make, a crowd of recreationists more variegated than the motley crew of Chaucer's Pilgrims to Canterbury, are a by-product but a by-product only of forestry. And even the purer waters of streams, their greater abundance and their wholesome influences on climatic conditions are not forestry.

Forestry is the science of producing wood and keeping it in sustained use for the benefit of men. And therefore, again the forestry problem of Indiana must be solved on the basis of public welfare.

Of all the materials that bountiful nature has bestowed on us, none has found so many ready uses as wood. For, while the minerals lie dormant until we reach out for them, the very life of a tree is full of productiveness in the interest of man; its death only marks a transformation of usefulness. For that reason the oft-heard claim that we will find a substitute for wood if we run out of trees is a dangerous fallacy, for we human beings need trees in order to enjoy the many products thereof, because in a world without trees we would not need any further substitutes having renounced our place to the reign of billions of insects.

So again we see how forestry has its ramifications in all human endeavor, how it is essential to human welfare—nay, to its very existence. Of late years there has come over many people in our state a keen realization that all is not well on that score. More and more it becomes patent that private ownership of forest land has been a round failure.

We have spent a great amount of energy and a considerable sum of money attempting to convince and encourage the private land owner in the practice of forestry with but little result. We cannot escape the fact that private ownership of forests and timberland is possible only, if immediate cutting is contemplated. It is impossible in the sense of forest administration.

When we condense our material, we find that about the only advantage in forestry practice that we can offer to the private owner, is the improvement of aesthetic and climatic conditions—surely a small boon for long risks and short profits. We cannot say it is a profitable investment because under present conditions it is not. Furthermore, the present disadvantages of private forestry are many. The income from the land used for agricultural, horticultural, and grazing purposes, for instance, is greater and is received daily, weekly, monthly, semi-annually or annually. Intensive agriculture gives an outlet for man-power and increases the local population, improves the public roads system which contributes to desirable social factors, together with establishing a greater number of churches, and social centers, and increasing the population of the school. With our waning forests our saw mills are disappearing and in some communities only one, or not even one remains which means no competition and a relative slump in the price of stumpage. The people of these districts will soon not know how to haul logs or have the necessary equipment for handling timber. The rapid development of the dairy business, the recent introduction and wide use of the silo, added knowledge of certain forage plants,

the high price of competing food products, all go to form an economic bulwark against which private forestry cannot stand. No agency except fire is so destructive of our woodlands as the grazing business which is now throttling our remnant forests.

With this in mind we are face to face with the fact that there are in the state large industries that depend upon the forests for their raw material and the employment of thousands of people. These great commercial enterprises are confronted with inevitable dissolution if some means is not worked out by which their future supply will be assured. If they go, many communities will be practically destroyed and even if the industry can afford to bring its raw material from greatly distant and foreign fields, the state must repay in a greatly increased cost.

Forestry in Indiana is not a local question, nor is it a political one. It is essentially a question which affects the prosperity and happiness of the coming generations.

The situation is acute. We must have a constructive forest policy which will establish a permanent timber supply. There is but little hope in private interest, although they may be urged into some activity by the proper classification of lands with corresponding taxation which will permit the placing of private forestry on a profitable basis.

It is seeming paradox that just as wood is the fuel for the very rich or the very poor, so is the tenure of forest land likewise only possible for the two extremes; the millionaire who makes a plaything out of it and the poor man whom it supplies with the return of a few wagon-loads of railroad ties, hoop-poles or tanbark, to maintain his precarious existence.

This, however, does not include the circumspect farmer whose properly arranged woodlots constitute a valuable farm asset, but neither can the woodlot be construed a solution of the forestry problem.

We cannot shun the fact that the question is one for the public and it remains for the state and the municipality to meet the situation. The state can carry the investment safer than the individual. A long time investment is no object. It is the duty of the state to have a forest at hand for national safety.

When in August, 1914, the world was set afire, we admitted in the following years that we were unprepared for war. Isn't it plain to us now that primarily we were unprepared for peace. And when we did arise in our might, what was it that lent substance to our energy and to our devotion but our wonderful natural resources.

Colonel Graves has told us and from Colonel Greeley we will hear a similar story—what part American timber has played in the war. If we could have that mighty contribution presented to us in one bill it would readily open our eyes to the immediate need of replacement.

This time we still had the substance. Let not another emergency arise and find us wanting.

Intensive growing of timber is work beyond the strength of the individual. It is more than a mere economic need; it is a solemn, patriotic duty for it aims to preserve the integrity of a nation.

Deep significance lies in the fact that our fore-fathers beheld the forest

with awe and reverence and attributed supernatural forces to its being. The cities and municipalities in the past timidly began with parks, but parks are not forestry. The Federal Government in some states has courageously plunged into the maintenance of public forests. The time has come when Indiana should follow suit on a large scale; the state as well as its municipalities. The extent to which they should engage in forestry will be determined by equating the value of the profits on the forest with the profits that might be obtained on the same land from agricultural crops including grazing. At least the location of public forests would be determined by this method, because it has always been axiomatic with foresters that land with high agricultural possibilities should be used for that purpose.

State owned forests would be in large bodies, hence, could be more economically administered and the management would be under trained foresters which would insure the maximum of income. Again, forests in large bodies would afford opportunities for revenue from game, from use as a hunting preserve and from park privileges in general.

The time for the inauguration of state forests for Indiana is today. We cannot afford to delay any longer. We must go to work at once and find the most economical locations; the method of financing; the administration and work out the great mass of detail consequent upon such a project. We cannot intelligently speak of the hundreds or thousands of acres, but rather in hundreds of thousands of acres, because we must get out of the time worn rut we have been running in, and realize that the question is large and pressing and that only by the intelligent management of hundreds of thousands of acres of forest can we hope to establish a permanent supply of Indiana hardwood.

The biggest problem is to place before the public the urgency of the situation; the necessity of action and responsibility that rests upon the civic body. Thankfully! the large upheaval caused by the world war has aroused the public from its old lethargy to a keen appreciation of its power and responsibility. There must be launched at once a campaign of education, through the schools and mails and the press, setting forth the present conditions of our timber supply and the requirements which will make it possible for the great wood-using industries to continue. Painstaking investigation is necessary to produce the authentic information with which the public must become acquainted.

The Department of Conservation is a willing instrument and I hope that it may prove an able one to make the people of our state acquainted with the prevailing condition. Together with Ohio and Illinois we have stated the purpose of our conference to be "an arousing of the public and wood-using industries to the need of action if our future timber supply is to be assured, to formulate a practical working policy of state forestry, outline a comprehensive legislative program and secure adequate legislative backing."

When we adjourn this meeting tonight after we have learned even more from the moving pictures that we are to see, then the real work should begin. It has been my pleasure to consult with a few of the gentlemen and we agreed that the following would be the best plan to conserve

the work of the conference, namely, that each state should form a Forestry Propaganda Committee of any size they wish to make it, have the committee select three men to serve on an Executive Committee—these men to be men connected with a wood-using industry and in sympathy with our movement. The committee should meet at an appointed place and outline the plan in general to be followed out simultaneously in the three states. The Executive Committees should carry the information to the state committees and make their particular wishes known to the governing body. The object is that we will be able to preserve the work that we have done here, keep in touch with each other, obtain the assistance of the Federal Government and put ourselves in a position wherever the legislature meets to assist in the formation of proper legislation.

In conclusion I wish to say that if the Department of Conservation had the autocratic power to bestow great blessings upon the people by its use, we would disdain to use it. For a finer sensibility of the purposes of a republican form of government teaches and invariably returns us to the full realization that lasting good can only come through the public voice of an enlightened electorate. In full security and confidence of its final decision we rest our case. (Applause)

THE CHAIRMAN: I know you have all been interested in the very able paper which we have just had presented and will have a few questions about it later. Now we will hear from Mr. Marcus Schaff, State Forester of Michigan, on the subject of "State Nurseries." (Applause)

MR. MARCUS SCHAAF: Mr. Chairman, and gentlemen: If forests are to be grown, and in our opinion they will be grown but for obvious reasons only or at least principally by the state and federal governments, then the forest nursery is an important consideration in any state forest policy worthy of the name. The primary object of such a nursery should be twofold. First, to insure an unfailing supply of dependable planting stock of the proper species and classes needed in the systematic reforestation of the state forests, assuming of course that the state already has or is to acquire acreage for that purpose. Second, to be able to furnish the necessary material for the planting of private holdings, not for ornamental effect but only for acreage planting with a view to the production of timber. Ornamental planting is more or less of a luxury little affecting public welfare, but to encourage as far as possible reforestation of private lands on a commercial basis the state can well afford to provide suitable stock at moderate prices to those desiring it. Under no circumstances, however, is it deemed advisable to distribute it free of cost.

In making provision for the production of planting stock on a large scale for use over a wide range of territory a choice of two plans is advisable. One is to have a single large nursery, located somewhat centrally with respect to the region to be supplied, in which all of the work is centralized and from which all material is distributed to the various points of consumption as needed. The other plan involves the establishment of individual and smaller nurseries, one in each of the localities to be planted such as the different state forests, or separate districts each of which includes a number of forests within easy reach. There are objections as well as advantages in either of these arrangements.

The principal points in favor of the single central nursery are that all of the operations are centered at one place and under one head, therefore resulting in better supervision, greater uniformity of stock and lesser cost of production per unit. Less initial investment is required for major equipment. The outlay on this account for a small station is comparatively heavy and it goes without saying that a large establishment can be equipped more cheaply than can a number of smaller similar ones. Consolidation and large output mean cheaper production. Nursery work is intensive and highly specialized and as such demands close and constant supervision by one well versed through practical experience in such matters if success is to be attained. Consequently one large nursery under the supervision of a competent man will be better managed than a number of separate places under as many different men. And above all, the central nursery is, if properly located, a permanent affair whereas the others are in their very nature more or less temporary.

On the other hand there are certain drawbacks that are inseparable from the central nursery. The work being of an intensive kind and therefore requiring much labor, there is the possibility when operating on a large scale of not obtaining sufficient help where production is restricted to one place. This is brought to mind all the more forcibly when we realize that state forests usually, and naturally, are located in sparsely populated districts. This problem may, however, be largely overcome by dividing activities as much as possible between the fall and spring seasons. The central nursery must be depended upon to produce all the stock required for planting not only in the immediate vicinity but in the remoter parts of the state as well. This involves transportation of the plants over long distances, which to say the least is in no wise conducive to their betterment. Then again there are somewhat greater chances of infestations of dangerous diseases where the tendency is to overcrowd or confine great numbers on small areas. Plants, like animals, are more or less subject to epidemics where extreme congestion occurs, and applicable to a certain extent in this case is the old adage that we should not place all of our eggs in one basket.

Considering the alternative of a system of individual local nurseries the following advantages are apparent. The work is distributed and the difficulty of securing the necessary labor diminishes in proportion. The place of production being on the forest itself, the stock is always immediately at hand and the delays and possible damage incident upon transportation are thus eliminated. Should disaster befall any one of the nurseries through any cause, there are the others to fall back upon.

This same plan carries with it, however, a number of decidedly objectionable features. The matter of supervision and inspection becomes as scattered as are the nurseries themselves. The area of each, and consequently the output, is apt to be so small as hardly to justify the maintenance of a qualified superintendent in each case and without such supervision, good results cannot be expected. The initial investment put into a place of small producing capacity can very easily be made to exceed beyond reason the demands to be met. In many instances, especially on the smaller forests, the nursery could not possibly be otherwise than temporary and temporary nurseries, implying lax or incompetent supervision, inade-

quate facilities and haphazard methods, are to be always avoided. All of which makes for either high cost of production or a less dependable supply of cheaper stock of inferior quality.

Our own experience leads us to believe that the establishment of one well-equipped, permanent nursery suitably located is by far the more advisable course to pursue. Or it might perhaps be good policy in a state where extremes of soil, climate and species are encountered, to effect a compromise and have two permanent nurseries, one to supply the northern and the other the southern half.

After deciding upon the general location, due attention should be given to the selection of the nursery site proper. There is a difference of opinion as to the soil best adapted for the purpose, some even maintaining that it should be as nearly as possible identical to that on which the trees are to be ultimately set. Practice, however, does not bear out this theory and it is only reasonable to suppose that a healthy, vigorous plant grown under the most favorable conditions will do better when transplanted to a poorer site than would a less vigorous one. On the other hand a plant less favored in the nursery will respond noticeably when transferred to a better soil than that in which it formerly grew. After all the soil to a large extent serves only as a physical supporter for the trees and by supplying in the way of fertilizers the elements necessary to their development good stock can be grown in any properly drained soil. In this respect more attention should be given to the physical condition of the soil than to the mere question of fertility, since it is easily possible and entirely practicable to supply the latter whereas adverse physical conditions cannot always be remedied and often only at great expense. A deep, fresh, porous, sandy loam free from stones and easily worked is preferable. It should have thorough and rapid natural drainage. Even an extremely light sandy but well-drained soil is far safer than a heavier and more fertile one affording poor or at best slow natural drainage, for in any case water can be provided artificially but only a light well-drained soil will itself take care of excess precipitation. Given a choice therefore between the lightest possible soil provided with water and a heavy agricultural soil the former is to be preferred. This applies more particularly to nurseries devoted primarily to the production of coniferous species but even in the case of broad-leaved species, which naturally affect a more fertile soil and which will undoubtedly enter into reforestation in this region to a considerable if not a preponderating extent, a good sandy loam will suffice and will very probably be not much inferior to the best soil that will ultimately go to make up the state forests. The site should be level, or practically so, and so situated as to permit of an enlargement in the future should occasion demand.

An absolutely essential part of any well managed nursery is a dependable water supply. Whether it be a temporary or permanent nursery it is poor policy to depend upon rainfall. One should be wholly independent of this by installing a complete irrigating system that will be adequate not only for the present but for all future needs. An underground system of pipes through which the water is delivered to hydrants, or possibly overhead sprinklers, is considered best in that it is permanent, does not interfere with

operations, eliminates danger of damage to the system due to sudden changes of weather and brings the water to the plants at a more equable temperature. The pipes need not be buried below frost line but all should be laid on a grade sufficient to drain them thoroughly in winter. Hydrants should drain underground automatically and should be provided at frequent intervals.

The size of the nursery will depend entirely upon the quantity and classes of stock that are required annually. Obviously a great deal more space is needed for growing transplants than for an equal number of seedlings and broad-leaved species as a rule demand considerably more room than do conifers. Ordinarily for conifers an acre of ground will take care of from thirty-five thousand to one hundred twenty thousand transplants, depending upon the length of time they are to remain in the nursery rows, whereas the same area devoted to the production of seedlings is sufficient for approximately two million two-year olds. But for a sustained annual output of say two million two-year seedlings twice this acreage is necessary since the trees occupy the ground for a period of two years. Likewise with transplants the space required to supply any given quantity per annum is dependent upon the number of years that they are to stand in the nursery before being sent to the field. In other words the amount of growing space to be provided is in almost direct ratio to the numbers and age classes desired annually. It is well, however, to allow for some additional ground so that some portion of the nursery may always be resting under beneficial cover crops so regulated that the entire area may periodically undergo a complete rotation.

As to the best cultural methods to be employed in the nursery no general rules can be given that will apply to all alike. So much depends upon the latitude, the site, the species to be raised, and like conditions. The question therefore becomes more or less of a local one, best met and solved through practice and experience in each individual case. Even with two nurseries where almost identical conditions obtain, the same methods may produce quite different results, or putting it another way, the employment of opposite methods may lead to entirely satisfactory results. The personal element enters very largely into the degree of success attained. In our own work we have found that discontinuance of a number of practices, at one time generally considered as prerequisites to success, has brought about marked improvements. Practically all of our seeding is now done in the fall, whereas spring sowing was formerly the rule. We no longer make use of shades for shade's sake, and the stock is none the worse off for lack of it. Mulch in every form has been dispensed with and a considerable item of labor thereby avoided, to say nothing of the subsequent beneficial effects upon the plants. And all of these innovations combined have apparently led to the total elimination of the dread disease known as damping-off. Originally, as was the custom, we attempted to combat this disease by the application of fungicides as a preventive but with only mediocre results. Now we feel that we can control it entirely by the simple cultural methods mentioned above. We are also tending more and more towards greater intensiveness in all lines of nursery work believing it to be economy to do so on the assumption that, other things being equal, the

more that is put into it the more will be gotten out. As an instance of this all ground preparation is now done by hand. Plowing is no longer permitted and a horse is not allowed in the nursery, all of the ground being carefully spaded. We do not, however, mean to convey the impression that this same mode of procedure would necessarily work out as satisfactorily in other regions.

Time will not permit us to enter into the details of the various nursery operations, nor is that deemed appropriate here. We have therefore merely touched upon what appears to us to be the outstanding features to be considered in the establishment and management of state forest nurseries. (Applause)

THE CHAIRMAN: I notice we have all been interested in this paper because we want to know more about nurseries. I feel that we are only in our infancy along this line. Now, to me the next subject on our program is the most interesting one that we have. I refer to the subject "Acquisition of Lands for State Forests." This was the subject given to Mr. I. C. Williams, Deputy Commissioner of Forestry of Pennsylvania. I hope some good suggestions that we can use in Indiana will come out from his paper. (Applause)

MR. I. C. WILLIAMS: Mr. Chairman, ladies and gentlemen, in presenting this subject to you, (I shall take the liberty occasionally to refer to some of the experiences of my own state and have brought with me a map of Pennsylvania. The black patches upon it represent the present Pennsylvania state forests. The scale of the map is six miles to the inch. This map will give you some idea of the size of some of our tracts.)

In any discussion involving a policy of land purchase for forest uses, obviously what first commands attention is some kind of land classification. For the present purpose it is proposed to divide all lands into two classes, agricultural and non-agricultural, or farm land and forest land, it being pretty well understood by this time that all soil not suited for growing farm crops is or may possibly be made suitable for growing a forest crop. Within the class forest land we will regard included all forms of barrens, moors, wastes, undrained swamps, rocky areas, as well as the better mountain and upland soil, either too steep, too high, or too poor for productive agriculture.

To determine what lands, then, are absolute forest or relative forest, in such states as the three represented in this conference, may not be an easy task. In the Appalachian region to the east or in the Rocky mountain region to the west, the problem is much simpler; but where the land is generally level, or slightly ridged by low hills, where extended bodies of woodland no longer exist, and where the farm woods are gradually melting away, the question is reduced to a nice balancing between the demands of the population on the one hand, for the products of the farm, and on the other, for the products of the forest. That we must have both, and in increasing quantities, goes without saying, else there would be no need for such a meeting as this.

It would therefore seem that a logical approach to the subject would be by some kind of survey and report, made by a properly constituted state authority, now existing or to be created for the purpose, equipped with

men and means, and unhampered by any other consideration than the immediate business in hand. No doubt there already exists a large amount of data in each of the states, gathered in the past by agricultural geological, or topographic surveys, and easily adapted to the needs of the new effort. The land which is agricultural will readily separate from that which is forest. It is with the areas which lie between where the greatest doubt arises. But a final disposal of the middle class lands need not immediately be made. Set aside by purchase or other means, the land determined to be forest. Begin a careful system of administration, protection, and development, guided by the principles of scientific and practical forestry, and within a reasonable time it will be apparent whether any state has too little forest land for its present and immediate future needs. Upon this determination it may rest the necessity of reachng out for the middle lands and forcing them into the class of absolute forest.

Among all the lands which may be set aside, widely varying conditions will be met. There will be large areas and small areas, cleared and cultivated lands of good quality surrounded by forest, drainage conditions favorable or unfavorable, valuable mineral deposits which have been sold outright or for the removal of which leases may be outstanding. Timber cover may be adequate, scanty, or none, values may be low and prices high, and titles clouded or uncertain.

Should it become necessary so to increase the forested area that some of the lands we have called middle must be brought in, this might be accomplished by a system looking to the establishment of ratable areas of farm woods. Upon many farms now not furnished with a tract of woods, there will be quarter and half acres, up to ten or more acres, where pasturage might be temporarily discontinued and a woody growth started. Existing farm woods may be strengthened, and, in the aggregate, a large area thus added to the woodlands of the state. At all events without state action, every farm should have a piece of woodland for domestic needs; and while it might be difficult to persuade a farm owner to plant a highly productive acre with red oak or tulip poplar, yet considerations of state policy accompanied by state action may make it necessary to require that it be done.

It is more than probable that the foregoing may be found as conditions, modified, of course, in practically all our states, and must be considered in every purchase. They are certainly true for Pennsylvania and constantly occur in the experience of the writer.

The history of the origin of our land titles shows a wide variance. The titles to land in the three states here met in conference are derived through an act of the Continental Congress, the Ordinance of 1787, preceded by grants to the United States of various state claims; while those for Pennsylvania are through the English grant to William Penn in 1682, the various treaties with the Indians and conveyances from tribal chiefs the will of William Penn, who died in 1718, and the Divesting Act of the Pennsylvania Legislature of 1779, by which, in consideration of £130,000, accepted by the Penn heirs, the title of the heirs to the whole of what is now that state, became vested in the commonwealth.

In proposing a form of government for his colony, Penn outlined "Certain Conditions or Concessions" and in Article XVIII thereof he states:

"That in clearing the ground care be taken to leave one acre of trees for every five acres cleared, especially to preserve oak and mulberries, for silk and shipping." It will thus be seen that the seed of practical forestry was sown in the virgin soil of Pennsylvania at its birth as an English colony; and to those of us who now live there it is a matter of lasting regret that the wise injunction of the founder was disregarded for two hundrded years.

Knowing conditions best as we have them in Pennsylvania, I crave your indulgence if the methods in use there for making state forest purchases be used as an illustration. The state of Pennsylvania is traversed from northeast to southwest by the Appalachian mountains. It contains an area a little less than thirty million acres. Roughly we divide the state into three parts, of which the mountains and their foothills occupy about one-third or a little less than ten million acres, most of which is absolute forest land. Another part, or about ten million acres, is wholly agricultural. The remainder, or a little less than ten million, is of that in between class almost too good for forest and too poor for agriculture. The areas of cities, towns, lakes, and rivers are also included in this class.

When the real forestry program started, about 1876, attention was directed to conditions at the heads of the larger streams. The people first became convinced that better stream flow meant better forest cover on the upper watersheds. All this great hilly and mountainous area, previously covered with heavy frost, was rapidly being uncovered by lumbering, with no attention given to regeneration or protection from fire. A Division of forestry was created in the newly organized Agricultural Department in 1895.

The earliest acts passed by the Assembly for the purchase of lands for State Forests, or forestry reservation, as they were then called, were of the session of 1897 and were two in number. The first provided for the purchase of land sold for unpaid taxes and the second for the establishment of reservations of forty thousand acres each upon the drainage areas of the three largest river systems, the Delaware, the Susquehanna, and the Ohio. The explanation given in the Act itself, for the passage of the first statute, was, "the preservation of the water supply at the sources of the rivers of the state and for the protection of the people of the commonwealth and their property from destructive floods." In that day everything had to be explained in advance, and we have not yet wholly passed beyond that stage. The second statute carried the right of eminent domain, giving power to seize lands suitable for the establishment of the reserved areas, could they be obtained in no other way. It may be noted in passing that it has never yet been necessary to invoke the aid of this extraordinary means of acquisition.

Purchase at tax sales was made to the extent of over sixty thousand acres. About one-half of it was subsequently redeemed. Lands acquired by these means are usually correct forest areas, but you are never certain of your holdings. The right of redemption, if exercised, will break up the continuity of tracts. I think we all agree that forestry is best practiced, most economically administered, with large solid bodies of land. At present, tax sale purchases in Pennsylvania have almost ceased. Wild,

unseated, mountain land is looked upon as having greater value than formerly, and the owners are paying taxes promptly. Twenty years ago, in certain counties, the treasurer's biennial tax sale advertisement in the local newspapers frequently covered a page. Today, in the same counties, it runs to less than half a column.

Purchases on the watersheds of the principal rivers proceeded rapidly in the acquisition of private holdings, but before the prescribed area of forty thousand acres had been obtained upon each of the watersheds named, the Department of Forestry was created by the legislature of 1901, and is now a constituent branch of the state government.

The Department of Forestry consists of a Forest Commission of five members, of which body the Commissioner of Forestry is one. The subdivisions at present are ten in number, each headed by a forester or specialist. Any suitable tracts of land may be purchased in any county, the test being its fitness for forest culture. The price to be paid was limited at first to five dollars per acre, but has since been raised to ten dollars. Where conditions relating to re-foresting and betterment of stand may be improved, timber may be sold. As a result of timber and mineral sales, made from what for the most part is abandoned land and decrepit timber left by the old-time lumbering, the department had paid into the state treasury $195,789.42.

In procuring forest land for state purposes, the first consideration is that it be forest land. Occasionally small areas of cleared, or formerly cleared, land, but now chiefly abandoned for farming purposes, will be included. These few acres are useful for many purposes, the chief being that they afford living places for forest officers. All deals and negotiations are preferred to be had directly with the owners. The department employs no agents to seek out lands and does not desire to deal through agents. Lands have been and are now being offered in abundance. All offers must be made in writing. If there is seeming suitability an examination is directed and made.

Because the state is in the market to buy land, some owners think fancy prices should be paid. They even at times try to exert political pressure to accomplish their end. Nothing counts with the Department of Forestry except actual values for forest purposes, and the value is determined by the prior examination, having due regard to soil, water, timber and location. What is determined to be the real value is included in the form of a counter offer to the owner. If declined by him the matter is at an end. If accepted, there follows the formal contract of purchase and sale, duly acknowledged by the owner, so that if necessary the contract may be placed on record.

Following the execution of the contract is the title examination. The Department has been singularly successful and fortunate in this part of its work. All title work is done by a regularly incorporated title company, whose expert examiners are the best in the state. Pennsylvania uses the old common law forms of title, and the unseated land titles are among the most complicated and difficult of the kind.

The title work is closed by a report of the examiner, certifying a clear title, if it be so, otherwise pointing out all defects, which must be remedied

by the owner before conveyance can be accepted. Sometimes the department waives defects of record, should they have an expiration of limitation, or otherwise in no way affect marketability. Occasionally it becomes necessary to have tracts sent back to tax sale to clear title, a process requiring from three to five years.

The title made right, there follows the formal conveyance by deed of general warranty, payment by the owner of all taxes due, payment of the consideration money, and recording the deed, which vests an indefeasible title in the commonwealth.

When the state of Pennsylvania originally granted lands to individuals in severalty, it did so by "warrants", which name has now come to be used for the tract of land involved, as well as for the legal process. Full warrants are definitely of record in the general land office, by metes and bounds, with location definitely fixed. Since the state parted with its lands by warrant areas, plus an allowance of six per cent. for roads, it now buys them back only in the same way. For this reason no prior survey on the ground is necessary to determine acreage, except in the case of partial warrants, where a survey and draft will be furnished by the owner, subject to the test of the department's engineering division.

The foregoing careful method of purchase has resulted in an almost total absence of title suits. The fact is that only two such suits have ever been brought and both were determined by the courts in favor of the state. In states where titles are founded upon recent government surveys, and where public abstract of title officers are maintained, all this is much simpler.

Any program involving a policy of land purchase for state forest purposes must of necessity look to several elements of far greater future value than present importance. One of these is timber. Wood products are being called for in ever increasing quantities, outrunning the supply, with prices keeping pace, and the great wood storehouses thousands of miles away. For this reason there is an appeal to all of us to grow our own wood in our own back yards, as it were. Why not? We have the land, or can get it. It will never be cheaper, probably, than it now is, and the need for a beginning is immediate.

The state of Pennsylvania has thus far bought outright 1,047,626 acres, for which it has paid the sum of $2,389,542.55, or an average price of about $2.25 an acre. At least this much more has been spent in administration, protection, planting, fixed charges, and general development. But the present value of this great estate is at least from twelve to fifteen millions of dollars. The policy of the state is to increase these holdings to at least six million acres.

Another element of immense future value is water power from streams on state holdings. An increase in the density of timber cover means better and steadier stream flow. No kind of power is so cheap as water power. The increasing price of coal may very soon force a resort to this too long neglected source of energy. In addition to being an inexpensive source of permanent power, it can best be controlled or utilized in state ownership or under complete state control. For this reason alone large purchases of land by the states are justified.

A third element which holds direct relationship to all the people and which cannot be ignored relates to health and recreation. Year by year more individuals and families seek the open woods for vacation purposes, and to these must be added the great numbers of honest hunters and fishermen who work hard fifty weeks in the year that they may enjoy two weeks of real life next to the ground in some great open woodland area. Nowhere may this recreation be had with less expenditure of money and energy than in state-owned land, and being the people's land they should have the right so to use it. All this may be done without interfering in any way with the use of the land for timber production or power.

It would therefore seem to be sound economic policy for the three states here represented to determine at once some comprehensive plan for state ownership and state regulation of land for public uses, adapted to their respective conditions. The time to do it is now. The insistency of the demand is such that delay is but deferring the problem, more easy of solution now than later when the pressure will be greater and the competition more intense. You will no doubt find it more difficult to accomplish the result among the level farm lands of these states than would be the case on the Atlantic seaboard or in the Rockies, but the greater the obstacles the greater the victory in overcoming them. It may be necessary and expedient to apply here in the first instance a form of state regulation for privately owned woodlands, as is proposed in the plan of my good friend Colonel Graves. It may amount to an expropriation of all suitably located private woodland holdings, placing them, if not at once into state ownership, at least under state management and control; and all this on the theory that the interest of the public is paramount. Should such conduct seem like an invasion of the sanctity of old-time private rights, we must remember that new problems demand new solutions and the precedents of the past may not always be found to be safe guides for the future. (Applause)

THE CHAIRMAN: As I said before, I was very interested in Mr. Williams' paper although I notice that conditions in Pennsylvania are quite different from those in our part of the country, but I feel as though he has made a number of suggestions that we can use. Now this is open for discussion but the hour is very late.

LT.-COL. GRAVES: I feel that these papers and the whole subject should be discussed pretty freely and thoroughly at this time and I suggest if we do not have time for discussion now that we meet here promptly at two o'clock and take these subjects up before we proceed with the program of the afternoon.

THE CHAIRMAN: If this is agreeable to you, gentlemen, that is what we will do. And now I want to say just a few words in regard to Professor Stanley Coulter, who will address us this afternoon. He is a member of our board of whom we are extremely proud. He probably knows more about forestry than any other member of our board. He is not present this morning, so I feel free to say these things about him—he has something worth while to say to us, something of interest, and so I want all of you to hear him this afternoon.

Some announcements were made by Mr. Lieber.

ADJOURNMENT.

THURSDAY AFTERNOON SESSION.

The meeting was called to order at 2:00 o'clock.

SENATOR GUTHRIE: We have had representatives from Illinois and from our own state presiding at our meeting and now I am going to call on one from Ohio—Mr. Secrest, will you preside at our session this afternoon?

Mr. Secrest took the chair.

THE CHAIRMAN: We had an interesting session this morning and according to a suggestion which was made just before we adjourned for lunch, we will now give some time to discussion of the subjects presented this morning. I hope you will feel free to discuss these subjects quite thoroughly.

PROFESSOR COULTER: A great part of the work was about the proper management and care of woodland. How do you provide for the expenses of that? Does the department pay it?

THE CHAIRMAN: In the case of woodlots the state has paid the expenses. In the case of timber estimates, the traveling expenses are paid by the owner. It may be questionable whether or not this is the proper thing to do, but it seemed the best to us. How far it will be carried out, I don't know.

PROF. COULTER: What appropriation have you?

THE CHAIRMAN: We have about twenty-six thousand dollars a year. It is a lump sum which we handle as we please as far as instructional and investigational work is concerned.

MR. FORBES: I would like to inquire of Mr. Lieber if I understood him correctly when he said the maximum price of some of the forest land secured was ten dollars per acre. I don't know of any ten dollar land in Illinois.

MR. LIEBER: We have recently made an investigation and Mr. Deam can answer you. He has found land for ten dollars an acre and perhaps some less than ten dollars.

MR. DEAM: Well, my experience in that line has been rather limited. We have located a few facts, however, about six hundred acres for eight dollars per acre and one owner said he could furnish about four hundred acres at ten dollars per acre. But in many parts of the state I have found that you can't buy any land of any type for less than twenty-five or fifty dollars.

LT.-COL. GRAVES: You mean that in buying land to work out a substantial program the prices would run something like twenty-five dollars?

MR. DEAM: Yes. There is quite a good deal of the land in the valleys which would run one hundred or one hundred twenty-five dollars. This land has good buildings on it, however.

MR. MILLER: I think we have land for thirty-five dollars or fifty dollars.

LT.-COL. GRAVES: Does that have any timber on it?

MR. MILLER: Yes, a little.

MR. SHEPARDSON: There is one kind of land in Illinois which is land which has been on top of coal, where the values from beneath the soil have been extracted and the ground at present lies idle and looks pretty desolated. I have wondered if these tracts would not make good forest reservations.

LT.-CAL. GRAVES: Mr. Lieber, you said in your paper this morning that you thought that the forest problems of these three states would have to be worked out largely by public ownership. Do you think at the present prices and with the present condition of the state's finances it would be possible to get enough land to carry out that idea of ours?

MR. LIEBER: That opens a very large subject. It is a matter of figures. If the land goes higher than fifteen dollars or perhaps twenty dollars, it is not practical to do it on that basis. It is a question whether it is possible to buy it outright and make it profitable or whether some other financial arrangement will have to be made.

LT.-COL. GRAVES: It seems to me that if it is a feasable thing to acquire lands on a considerable scale that it would be a desirable thing for all of these three states definitely to work for a policy of public ownership. I think we should be in a position at this conference to reach a conclusion on a few of the larger points. Colonel Lieber suggested a method of organization between the three states which would form a splendid basis for working out a program. I should like to go on record as being in favor of a policy by these states for the purchase of lands to establish state forests as extensive as conditions will permit. In the working out of the Weeks law of purchases by the government, we found that a good many of the objections were much more easily overcome than had been anticipated. Of course we had a very large country to draw upon which enabled us to secure lands at very reasonable prices. Personally, I believe that in the long run if you can embark a policy of that kind, if you don't try to push it too fast, that you will be able in the long run to obtain lands at prices which would be well worth while for the public—in the form of receipts or in general public benefits which can be very clearly shown. I believe that you can work it out.

We have found that every tract that we buy is a center of co-operation and interest in the surrounding country.

THE CHAIRMAN: From the statements made here regarding Indiana and Illinois, Ohio appears to be radically different. When we first purchased tracts of land, we had land we could get from three to five dollars an acre and some from eight to ten dollars an acre. I don't think that the price of lands is going to be any obstacle at all in the way of acquiring state forests in Ohio.

MR. WILLIAMS: Someone spoke of land from which coal had been removed. Why not purchase only the surface rights? In Pennsylvania we have endeavored to purchase the whole title and up to the present time have done so.

I think I will also revert to the question of Senator Guthrie raised in regard to the amount of money we are using in Pennsylvania to carry on our forestry work. The fact is that at the session of the legislature in 1915

they gave us $619,700 for two years' work. In 1917, $813,000. The question was asked as to where the money comes from. We do not grow it on trees. A certain sum of money is set aside for us,—definite sums for definite things. I have a statement of the appropriations for 1919:

Department Administrative Expenses	$ 353,200
Surveys	6,000
Labor	190,000
Purchase of Lands	130,000
Materials, Equipment, etc.	85,000
Bureau of Forest Protection	90,000
Forest Academy	30,000
District Foresters	15,000
School Charges	43,000
Road Charges	43,000
County Charges	21,500
	$1,006,700

LT.-COL. GRAVES: The papers this morning and some of the papers yesterday afternoon made mention of co-operation with the Federal Government. I am referring to the interests of these three states. Just what that co-operation should be was not specified. Co-operating with the Federal Government in meeting this problem will mean that there is a responsibility on the part of these states in connection with the federal acivities and in the establishment of instructive measures. One of the things which can be done, which we are trying to do, is the purchase of lands by the Federal Government. We have laid out a program in the southern Appalachians of about a million acres. We believe that this program is much too small for the public needs in the long run. We have talked a good deal about general co-operation with the Federal Government. The Federal Government is to be able to co-operate with these states as well as other states. It is but a question of expressing your interest and demand co-operation and you will get it. If the public don't want this, it won't be forthcoming.

THE CHAIRMAN: If there are any other questions, now is the time to ask them.

MR. LIEBER: May I suggest we begin our regular program because we will have a number of questions to come up after our papers have been delivered this afternoon.

THE CHAIRMAN: We will proceed with our afternoon program. We have with us a gentleman who has been connected with the State Board of Forestry ever since the work was organized in Indiana. It gives me pleasure to introduce Prof. Stanley Coulter. His subject is "Forestry Educational Policies."

PROF. STANLEY COULTER: I do not purpose making a formal address upon this subject, since I feel it more important to develop a discussion than to present a paper.

In discussing the topic we should remember that four groups are to be reached and that the method of attack differs with the group. These groups are the children easily reached through the schools; the woodland owner, the great indifferent and inert public and last of all and perhaps most difficult of all, the law makers or legislators.

I may premise by saying that there is a very great difference between propaganda and education. Propaganda has been over-done and certainly has far outrun knowledge. We have in the office of the state Forester records upon some hundreds of tree plantings in the state. These plantings cover thousands of acres and, originally at least, contained hundreds of thousands of trees. It is, however, a conservative statement to say that 85% of these plantings are failures, that is, that the sale of all of the product at the highest market price would not produce an amount equal to the outlay.

In this conference, much has been said about stimulating interest in forestal problems. I think that at one time there may have been a need for such stimulus, but I feel that time has passed and that the present need is for education. The plantings to which I have just referred show clearly a quick reaction to the stimulus; the failures show that zeal had far outrun knowledge and indicate that the next step is the development of some educational policies.

Much of the educational work so-called, has been done in the public schools with children. In every instance the purpose has been laudable, but in most cases the methods have been inadequate and the results unsatisfactory. Arbor day ceremonies served to arouse spasmodic enthusiasm, but with all of the Arbor Day plantings the school yards are nearly as destitute of trees as at the first observance of the day.

Nature study promised much when first introduced into the schools, but it soon became manifestly purposeless and altogether sentimental in so many cases that it is to be regarded as of doubtful educational value. Its chief fault seems to lie in the fact that as administered at present, it seems to have no objective and serves in the main as a means of relieving the monotony of the ordinary school duties. At the same time I believe that no more valuable educational weapon lies within our grasp, if we can train ourselves in its right use.

I think that in any sound Forestal Educational policy we should see that our foundations are sufficiently broad. Forestry is after all but one of the phases of the far greater problem of the conservation of our natural resources. The mistake has been made in almost every instance, in considering it as a thing apart, leaving out of account its relations to a great problem which in some of its phases interests every one. Much of the weakness of the present Forestal Educational policies is to be attributed to the fact that it has been presented from too narrow a viewpoint.

The form and content of the subject should, it seems to me, be worked out in the main by the people who teach, after consultation with the people who know. Most of the books in use have been written either by people who can teach but do not know the subject, or by people who know the subject but cannot teach. The teaching of forestry should begin in the schools in order that the next generation may have a proper appreciation

of the manifold values of this great natural resource. If this is done we must have a different type of text-book in Forestry for the graded schools. Probably the main appeal of such texts should be the economic. Sad as it may seem, this is apparently the most successful of all lines of attack. Whether you desire to have a bill passed by the legislature, or to stir a great mass of people to action you practically insure success by working along economic lines. It is almost certain that if educational work in Forestry results in continued interest and ultimately develops a new mental altitude regarding the preservation and development of our timbered areas, it must have underlying it this economic relation. The type of work that should be done lies fairly clear in my mind. There are many men in this country who could give us such texts, but the immediate need is to realize the importance of centralizing such an educational movement if we hope for a new view-point as to our natural resources on the part of the next generation.

Educational policies as they relate to the land owner are of quite different sort. He should be taught in some way or other to classify his land, separating at least roughly between that suitable for annual crops and that suited primarily for forestral purposes. He should be encouraged to plant trees in such areas on his farm and should be advised as to what particular forms he should use in his particular case. We have not watched over the land owner's interests as we should. We have awakened his interest in tree planting and then left him at the mercy of any tree salesman who might visit him. We have left him in utter ignorance of the ecologic conditions necessary for the successful growth of the different species of economic trees.

Again there should be, and this in plain untechnical language, instruction in estimating the value of his timber crop. He does not know how many thousands of board feet his woodland is carrying to the acre, neither has he any method of estimating it; he does not know the differing values of the various species nor the modifications in their values due to size, to defects, or distance from the mill. In marketing his crop he must rely wholly upon the honesty of the purchaser. This condition does not obtain as regards any other land product and until it is remedied but little progress can be hoped for in woodland forestry. Of course, bulletins have been issued by the National Forest Service and by the states, of high value to those who can carefully study them, but I can see a small handbook of from thirty to fifty pages which would do more in the effective education of the woodland owner than a library of the finely scientific bulletins which have so greatly aided the student but have not as yet met the real needs of the landowner in any practical way. Evidently the education of the landowner is one of the most important features in any sane forestal educational policy. The maintenance of existing areas in anything approaching a normal stand, the utilization of waste areas for timber production, the increase of values by improving the quality of the timber whether by silvi-cultural methods or changing the proportion of the species in the stand, all depend on such education. We have failed to give him any adequate information in a straightforward, understandable way as to the length of his investment or the time which must elapse before

he can harvest his timber crop. Each one in this audience has been asked scores of times this question: "If I plant trees how long will it be before they are post size, or large enough to market?" The average man is not greatly attracted by a long time investment, and unless we can educate him to believe that such an investment is desirable because of its safety and the certainty of its ultimate returns, we will see our woodlands not only diminish in area but also in quality.

Incidentally the landowner should be made to understand that high grade land suitable for annual crops should not be used for forestal purposes. Only the other day a man asked me to advise him as to what trees to plant on some ten or twelve acres of land he proposed to devote to that purpose. When asked the value of the land he gave it as one hundred and fifty dollars an acre. Of course the answer was easy—plant no trees on such land, raise annual crops. I could take you to catalpa plantings in this state on land worth over two hundred dollars an acre.

Another matter should be emphasized in the education of the landowner and that is the impossibility of having a woodland and a woods pasture on the same area. A perennial question is: "Under what kind of trees will bluegrass grow?" It is perhaps too much to hope that the present generation of landowners will get away from the conviction that "woodland" and "woods pasture" are not synonymous terms, but any forestal educational policy should provide against this fatal fallacy being carried on into the next generation. The other day I asked one of my assistants to go through all of the bulletins that have come to me from the Forest Service and look for those giving directions as to procedure in the establishment or improvement of woodlands. He looked over some five hundred bulletins and reported there were none bearing upon that subject. This of course does not prove that there are not such bulletins but it does indicate that they are not as numerous as the importance of the subject demands. In this field again the forestal educational policy should be centralized, at least to the extent of unifying the principles laid down in such cases. In any event a nation-wide campaign emphasizing certain basic practices in successful woodland management would be far more effective than the present haphazard method, under which bulletins issue as they "happen" rather than in accordance with a definite and clearly wrought out policy. In a word, in the past in this phase of forestal endeavor there has been too much propaganda and not enough education.

The great mass of people and more especially, those in urban communities are not especially interested in forestry. Points of contact are relatively remote and yet before any very great advance can be made these uninterested people must be interested and made apostles of a new order. One of the best methods of awakening interest is through an appeal to local pride. In Indiana, the purchase of Turkey Run park and Spencer park, the acquiring of the State Forest Reserve, the agitation for a great park area in the dune region, and the development of municipal parks has done more to further interest in forestry than all other agencies combined. From these lesser areas with restricted use to the larger areas with limitless possibilities is an easy and natural step. When in addition to this the people are educated to a realization that these parked and for-

ested areas are for them, for their pleasure and benefit, the problem of the education of the people is solved.

Of course, this interest must be kept alive by a proper and almost constant publicity, made as attractive by illustrations and other devices as is possible. Foresters are scientists and in common with other scientists are much to blame for the present general and almost appalling lack of interest in their problems. Their method of attack has been wrong, and the emphasis has very often been wrongly placed. To meet this need, to awaken this interest, educational tools must differ materially from those in the former groups. Here also the need of a centralizing agency is evident if the highest efficiency is to be secured. Our war time efforts in financial lines have amply proven the efficiency of concerted action in the securing apparently impossible goals in an almost incredibly short time. A sound educational policy will quickly utilize this dynamic fact in mass psychology.

But after all we must acknowldege the fact that no very great advances over existing forestal conditions are possible unless in some way we can educate our legislators. The men who constitute our legislatures in the main, have pledged themselves to give the people a "business administration." Ordinarily that means they will vote against every bill carrying an appropriation if it is at all possible to find the slightest justification for so doing, and where they are compelled by circumstance to vote affirmtively will "trim it to the bone." Now forestal advance means money and it means money from the state. Money for acquiring lands, money for the purchase of parks, money for the forester with his office and field force. This of course, means that legislators should be educated in such a way that they can see the economy of forestry. As a rule, these men serve only a term or at most three or four. Our educational work must therefore be intensive. Further it must focus upon one point, the economics of conservation and therefore of forestry. It might even overemphasize the point by demonstrating that the failure to pass adequate forestal appropriations was irrefutable evidence of unwillingness to give the people a "business administration." Such work would necessarily be done through compact and attractive folders or bulletins, which would, however, have to be prepared with infinite care and skill. It would be easy to name a dozen men in this country any one of whom could prepare a series of such folders or bulletins as would show to the average legislature the economy of conservation in a compelling way. This work has, in the past, been either neglected or so hastily done as to partially defeat its own purpose. Here again there is need of a centralizing or co-ordinating body, in order that a forceful presentation of the arguments in favor of conservation measures may be made in every state in which legislative action is sought. I have omitted purposely any suggestion as to the work in the Forest Schools of the country. This work as we all know is not only well organized but is in most cases being administered with rare skill. These schools can be trusted to keep pace with all forestal advances. Neither have I spoken of the training of the forester himself, although personally I believe the effective forester will be found to be made up of about one-tenth technical skill and nine-tenths common

sense. I have only sought to bring to your attention points in which I felt forestal educational methods were deficient and to suggest possible remedies. From my point of view the vital educational work at the present time is as follows: First, with the children or the outlook for the future; second, the education of the landowner along extremely definite and practical lines; third, the education of the general public to the end of securing a far wider spread interest, and fourth, the education of the legislator in order that he might have a firmer and more intelligent grasp upon the economies of conservation. I believe some such plan should be worked out in the immediate future, and that the organization of a committee to formulate forestal educational policies should be considered by the Forest Service. (Applause)

THE CHAIRMAN: We are very glad to have with us this afternoon Mr. P. S. Ridsdale, Editor American Forestry. His subject is "Forest Publicity." (Applause)

MR. P. S. RIDSDALE: Mr. Chairman and gentlemen, you have Colonel Graves' remarks about the necessity of public participation in securing a national forest policy, you have heard Mr. Lieber speak of educating the public, you have heard Mr. Coulter speak of the uneducated public and now I am going to tell you how to help educate them and how to get their co-operation. All of you know without being told of the value of publicity. You all know that it was publicity that helped to put across the big Liberty Loan drives and Red Cross drives and War Chest drives and every other kind of a drive during the great war.

I just noticed a clipping in a paper the other day which said public matters printed in newspapers in Indiana alone, received the attention of five or six million people. I want you to realize that the newspapers are perhaps the greatest aid to publicity that can be found. The newspapers have treated the various phases of the forest situation which have been fed to them by the Agricultural Department in an editorial way as well as a news item. I can go on quoting for hours from newspapers which we receive day after day and in them you will find the trend of public opinion. We have had editorials on shade tree planting and all kinds of editorials on all kinds of forestry subjects. I can tell you any number of stories that we have featured that have helped to awaken the interest of the public but I do not want to take up your time.

My message is that the newspaper men are standing ready to co-operate with you in putting across any program which you may have. We are ready to give you more space than we have given and are ready to push your whole program for a forest policy. (Applause)

THE CHAIRMAN: Our next subject relates to wood-using industries. It is "The Timber Supply in Relation to the Retail Trade." Mr. Findlay M. Torrence, secretary of the Ohio Retail Lumber Dealers' association is our first speaker on this subject. (Applause)

MR. FINDLAY M. TORRENCE: Mr. Chairman and gentlemen, if you will bear with me, I am going to change my subject to read "The Retail Trade in Relation to the Timber Supply".

The lay public naturally looks to the local lumber dealers as an authority on trees.

When the ladies Friday Afternoon Society or the Nature Study Club asks him to read a paper about the trees, he usually feels complimented and manages to crib a few statistics and make good. But he does not take the job very seriously. I believe that he should take the job seriously and to that end I have a few suggestions to make.

One of the curious phases of the retail lumber industry today is the air of complacent detachment and indifference of the average retailer of lumber toward all problems of timber conservation. To him a sixty year supply of timber seems like an eternal supply.

The attitude of the retailer is too often a feeling that "sufficient unto the day is the profit thereof". He is too prone to regard as visionary and academic those discussions and those movements which have to do with the future stability and permanence of his business; the welfare of his industry a score or more years hence.

I was reminded of this attitude very forcibly when I endeavored to make some inquiries among the Ohio Association of Retail Lumber Dealers relative to the local timber supply in relation to the retail lumber trade.

I discovered that less than 2% of the members of that association have any saw-mill connections or any financial interest in local sources of timber supply, and it is manifest from the discussion of the conservation question in our district meetings that a still smaller percentage of them feel any personal concern in the preservation of our forest resources.

The retailer of lumber is not to be censored too severely for this attitude. The problems of his business are so manifold; the competition he encounters so keen and the general technique of his profession is so exacting, that the average lumberman must keep his nose to the grindstone and his eyes glued to the opportunity immediately ahead, rather than to problems which he feels will concern a succeeding generation. At least he must do so when acting in his individual capacity.

And yet I believe there is a possibility of making the retail distributor of lumber an effective agency for constructive conservation work.

If this is done, however, the appeal will have to be made to the retailers collectively, rather than to the retailer as an individual. The retail dealers will have to be interested in the work through an appeal for such service from their local and district state commercial associations.

The aggregate membership of the lumber organizations in the three states participating in this conference, is more than 1500. Each state association is now thoroughly and efficiently organized, with local zone or district groups, comprising the dealers in every city, county, or several adjacent counties. It is these groups of lumbermen which I feel could be converted into effective agencies through which the state departments of conservation could be assisted in functioning.

In the first place, if I may digress slightly, I do not see why the lumber manufacturers' associations, such as the Southern Cypress, Southern Pine, West Coast Association, etc., should not be encouraged or required to assume responsibility for reforestation projects as associations. What may prove to be a very burdensome and poorly performed duty, if required of the timber manufacturers, as individual competitive concerns, might be eagerly and efficiently performed as an association enterprise. Espe-

cially would this be the case if the lumber manufacturers were permitted to assess the cost of the undertaking against the consumer of lumber, where it should properly be distributed. Thus the consumer of lumber as such would be called upon to provide a sinking fund for the amortization of his debt to future generations for his use of timber resources which belong to succeeding generations just as truly as to the present.

I do not feel that a plan of reforestation which the lumber manufacturers would regard as compulsory and unfair will ever be a success. Such organized opposition as they are in a position to give coercive reforestation programs, would result merely in lavish expenditures for court procedure. And in the national forestry project becoming a political issue, we can readily see how impossible, how absolutely disastrous it would be to have the problem bandied about between contending political parties with one party carefully nullifying all that their predecessors in office had accomplished.

But I do not feel that the lumber manufactures would regard as coercive the requirements that they turn over to their association a certain number of pennies for every thousand feet of lumber they sell to be used in reforestation.

Such an arrangement would give the associations a certain property nucleus which would do a great deal to insure their permanent functioning. Such a plan would also call forth the competitive impulse as between the associations representing the different species.

And such a plan would avoid the tendency toward state socialism which lies in the direction of the entire forest resources of the future, being the creation and property of the government rather than the creation of private enterprise.

It may be objected that these organizations are only indirectly or vaguely of a public character, and that they might not therefore be responsible custodians of such a trust, but is it not true that we have neglected too much in the past the opportunity of utilizing organizations of a quasi-public character in the administration of public and patrotic work?

The war taught us what these organizations might accomplish in the tasks incident to community or national welfare.

It is true that the commercial organizations to which I refer are created for a selfish commercial purpose, but I am sure that they would welcome the opportunity to broaden the scope of their activities and undertake a work such as I gather it is the purpose of this conference to launch.

During the war some statesman asserted that no institution would survive long after the world war, which could not demonstrate that it contributed or ministered in some essential degree to human welfare.

Applying that standard, I am somewhat inclined to question whether or not a commercial organization which has no reason for existence other than the selfish aggrandizement of its members is justifiable.

The day is here when the serious and thoughtful organization executive recognizes that his organization must be made an implement for the advancement of civic and patriotic interests; for the promotion of public and community welfare, as well as for the advancement of the interests of the organization members.

I do not believe that any quasi-public organization, be it commercial, social or labor organization, will be long tolerated—or should be tolerated —which can not demonstrate that the public welfare as well as the interest of its members, is advanced through its activities.

The organization executive of serious purpose realizes that he directs a vehicle of powerful influence for good or evil. He is confronted on all sides today with evidences of the misuse of that power by thoughtless and irresponsible organization leaders.

The menace of the destructive possiblities of purely selfish or misguided organizations has awakened the conservative organization leader to a new sense of his responsibility in the social and economic fabric.

You will find these organizations eager to devote time and money and effort to such public spirited activities as your State Departments are now fostering. You will find the Lumber Dealers' Organization eager to be of service in forest conservation projects.

Of course, the details of their participation will have to be carefully worked out, but it would seem to me that they might serve effectively in conducting a survey of timber areas in each of the local communities and that they could report also areas that could be more profitably devoted to timber crops than to agriculture.

Second, they could conduct educational campaigns against uneconomic and destructive methods of utilizing wood lot products.

Year after year the retail lumberman has sat placidly by and watched his farmer patrons sacrifice potential fortunes in young hardwood timber, in the belief that tamarack, cedar, locust or cement fence posts were too high priced.

The Retail Lumber Organization should combat these practices by educational campaigns in reference to commercial value—the present and the prospective value, of various species and growths of timber.

I see no reason why the Lumber Organizations should not go further than this, and even become owners of timber conservation tracts in their respective communities.

Commercial and social organizations responded loyally to the "Buy-a-Bale-of-Cotton" campaign some years ago. Why should they not respond just as readily to the "Own-a-Tract-of-Timber" campaign.

I feel sure that the local lumber dealers' clubs and district organizations at least could be interested in such a campaign. Such co-operative ownership and enterprise would give them, for one thing, a property nucleus, which would go far toward insuring a live, permanent interest in the organization.

Areas that should be in timber to prevent erosion can generally be bought very cheaply. When such tracts are disclosed in the association survey to which I have alluded, they should be bought up, if necessary, by the organizations of lumbermen.

There is an instance in point at the present time in my own county in Ohio. A large and well-timbered farm, known as the John Bryan farm, has been bequeathed to the state for a game and forest reservation. But a provision was stipulated by the eccentric donor that there should never be any religious services conducted on the premises.

It is improbable that the state officials ever would have repaired to the Bryan farm to pray, if the donor had not mentioned this stipulation, but as it is, there has been a good deal of opposition expressed by religious organizations against the state accepting the farm under this condition.

Now, in a case of that kind, if the opposition should definitely block acceptance of the gift, steps should be taken to have some semi-public organization or organizations ready to step in and keep the timber preserve from being lost to posterity, as it assuredly will be if it is sold for private exploitation.

It has seemed to me that for the greater part of this territory the problem of timber conservation is chiefly one of intelligent maintenance of the farmers' wood lot.

Most of the young growth on these wood lots is sacrificed for fence posts and similar uses on the farm. The lot is then closely pastured so that the seedlings have no chance. The wood lot soon becomes a grove of matured trees, and it is ultimately skinned off entirely. This practice can be combated by the right kind of educational propaganda, and organizations such as the one I represent should be encouraged to make it their duty to spread the propaganda. The State Bureaus can accomplish much, I am sure, by encouraging the State, District and Local Lumber association to assume repsonsibility as custodians for timber areas, trustees for the permanent protection of sylviculture in their respective communities. (Applause)

THE CHAIRMAN: We will next hear from Mr. Harry Scearce, who is a member of the Indiana Retail Lumber Dealers' Association. (Applause)

MR. HARRY SCEARCE: In a study of the lumber industry covering the distribution of softwood lumber in the middle west, made by the Forest Service, it was learned that over ninety-five per cent. of the lumber sold in this territory is distributed through the retail yards.

In 1914 eleven of the central states had eleven hundred yards, eighty-one per cent. being in towns of two thousand five hundred and less, and sold over seven billion feet of lumber, this being an average per capita consumption of approximately three hundred feet.

To illustrate what this means: Indianapolis has a population of three hundred thousand in round numbers, applying the average annual consumption of three hundred feet, means that it requires ninety million feet of lumber, or thirty-six hundred carloads of twenty-five thousand feet, to supply the demand in this city from the retail yards.

To move all of this at one time, would require thirty-six thousand three ton trucks, hauling twenty-five hundred feet each and forming a procession in close formation two hundred miles in length. Applying this to the entire country, in which it is estimated there are forty-two thousand retail lumber yards and you have some idea of the importance in the industry of the retail branch.

The investigation of the lumber industry by the Forest Service, at the request of the Federal Trade Commission, has cleared away many erroneous impressions held by the public, especially in reference to the retail part of it.

The economic necessity of the retail lumber yard was established beyond question, for it was found that of the more than twenty-seven billion feet sold in the entire country at retail, the average sale was considerably less than $100.00.

Quoting from Forest Report No. 116, "Considering the location of the bulk of the saw mills with respect to the one hundred million lumber consumers throughout the United States, together with the service demanded by the average user, it comes apparent that some type of local retail yard which assembles stocks of lumber from several producing regions in carload lots and provides time and place utility for the customer is essential to the practicable distribution of the bulk of the lumber required in relatively small and diversified amounts.

"The retail dealer who makes a technical study of the relative merits of different structural materials for different uses may occupy the position of an unbiased adviser who is capable of rendering a valuable economic service to this community."

The retail lumber dealer, then, who comes so directly in touch with the user is most deeply interested in the source of supply of timber, how long it will last and what is being done to conserve and replenish it. The United States has had during the past forty years, three great principal sources of supply, The Lake States, The Southern States and the Pacific Northwest.

According to a recognized authority, the present supply of all merchantable timber is two thousand six hundred thirty-seven billion feet, as of January, 1916, of which one thousand four hundred eighty-two billion feet, or fifty-six and two-tenths per cent. is in the Pacific northwest, Oregon, California, Idaho and Montana; five hundred forty-five billion feet, or twenty and seven-tenths per cent. in the southern states; ninety billion feet, or thirty-four per cent. in the lake states, and the remaining five hundred thirty billion, or nineteen and seven-tenths per cent. in the remaining forest regions, including the central hardwood belt.

The record of production covering the thirty-five years from 1880 to 1915, discloses that the lake states produced in 1880 thirty-five and one-tenth per cent. of the lumber from the three great districts, but in 1915 only nine and three-tenths per cent. was produced in that territory. The southern states were producing fifteen and nine-tenths per cent. in 1880 and rose to forty-eight and nine-tenths per cent. in 1915, while the Pacific northwest furnished but three and eight-tenths per cent. in 1880, while in 1915 it was cutting twenty-one and four-tenths per cent. of the total.

My own experience in the lumber business goes back to the early part of the nineties, just about the time southern yellow pine was getting into the markets north of the Ohio river, and beginning to displace white pine and hemlock in southern Illinois, Indiana and Ohio.

Prior to that time the chief source of supply of the states represented in this conference had been Michigan, Wisconsin and Minnesota. Saw mills located along the Mississippi river and supplied with logs brought down in rafts from the woods above, distributed their products through Illinois and westward, while large distributing yards located at the lake cities received barges of lumber from the mills in the north and shipped it out over Indiana, Ohio and the east.

Michigan City was the principal point of distribution through a large portion of Indiana, and it was no uncommon practice for large retail dealers in Indianapolis and other cities to purchase an entire barge-load of lumber and bring it to their mills where it was worked into flooring, siding, finish, etc., and sold to the dealers in the smaller towns. At that time the demand was confined to three or four different kinds of wood, the base of supply was near, and the investment of the average retailer consequently was small.

I recall when hemlock dimension lumber was shipped into this market from Michigan City and sold at retail for $11.00 per thousand. The freight, as I recall it, was about $1.25 per thousand feet. However, as the timber in these states that were located near the water was cut out, and it was necessary to build railroads far into the woods, prices began to rise and southern yellow pine, which at that time could be found in great quantities along almost every mile of railway through the timber states of the south, found a market in the north.

The freight rates were low, being an average of about $4.50 per thousand feet. Stumpage accessible to railroads could be bought for $1.00 to $2.00 per acre, and as a result, prices of yellow pine lumber were low. Recently when looking over the invoice of the first car of lumber bought by my company, when we began business in 1892, which by the way was yellow pine, I find we paid, delivered, $16.75 per thousand for four inch Star flooring, that grade being practically clear, $14.00 for ten inch, number two boards and $14.75 for six inch number one common drop siding. These prices do not represent the present cost of freight from the northwest.

Now when the easily accessible timber in the south has been cut and logging operations have become very expensive, prices have sharply advanced. Freight rates have gone higher as the average haul has become longer, the rate from the south being now practically double that of twenty-five years ago.

Statistics of the supply and cut of timber show that the source of supply is again shifting and the northwest is now the only great reservoir of supply left, but on account of the great distance and expensive methods of logging made necessary by the broken country and great size of the timber, we can not expect the low prices that have prevailed in the past at the opening of a new timber supply.

At the present rate of cutting, figures given being as of 1916, the supply of all available merchantable timber in the United States, making no allowance for new growth and based on present utilization and consumption, is shown as follows:

Pacific Northwest	166 years
Southern States	30 years
Lake States	21 years
All Others	70 years

or an equivalent of over seventy years. This discloses the rapid approach of the end of the supply in the lake and southern states, and means that soon the entire central west and east must depend upon obtaining all their supply of timber from the northwest, at a freight cost, based on present

rates, of from $16.00 to $20.00 per thousand feet, unless some practical plan of reforestation is speedily adopted. In some sections of the south, pine has grown up since the Civil War and is now being cut and marketed in the form of small dimension and common boards and when put to uses for which it is suitable is practically as good as virgin timber.

This fact merely indicates the possibility of growing timber in a commercial way in certain localities. I am not prepared to discuss policies or plans of reforestation, as I possess no technical knowledge on the subject, but from the standpoint of a retailer, knowing the far-reaching effect upon prices when almost the entire supply of timber is confined to one section of the country and the consequent decline in the use of lumber as a structural material, I feel that I may safely represent the retailers of Indiana as favoring national and state legislation that would have for its purpose the reforesting of a vast acreage of land that is not suitable for highly developed agriculture, but is adapted to the successful growing of trees. Given proper tax exemption, timber landowners could be encouraged to reforest the land from which the trees have been cut. Waste in logging operations should be avoided so far as possible, but perhaps the only practical solution of this is for a market to be created for that which is now not worth bringing into the mill and manufacturing.

This is a feature of conservation that is largely up to the retailer. In the past it has been the practice of the public to demand certain standard lengths of lumber, regardless, in many cases, of the purpose for which it was intended.

If, for instance, four-foot lengths were needed, the order almost invariably would be for twelve or sixteen-foot lengths. Until recent scarcity of stock at the mills, resulting from war conditions, short lengths were not easily marketable at prices that would make it profitable for the mill to utilize the full cut of the log, and waste resulted.

That there is a use for lumber two feet and longer is obvious to anyone who has given careful thought to the uses to which it is or may be put, and with the proper effort on the part of the dealer, the user can be induced to buy eight two-foot pieces instead of one sixteen, if the former is the length needed.

In other words, if the retailer of lumber is to best serve the public, he must seek to bring his merchandising methods to the highest point of efficiency. His place of business must take on more the aspect of a lumber store, rather than merely a yard, which is conceived by the public to be a piece of ground covered by a miscellaneous lot of more or less orderly piles of lumber, to be first sent to a mill to be worked or put in shape by a skilled carpenter before it is ready for use. This is true of a considerable part of the lumber that goes into general construction, but there is a demand for small ready-to-use pieces, the supply of which, to the public, would result in a closer utilization of the tree in the woods and at the mill.

The retail lumber associations have done a great deal to bring about better methods in the distribution of lumber. The programs have been almost entirely given over to the discussion of economies, efficiency of service and better accounting. The problems of conservation and reforestation are now recognized as vital to the industry and from now on will receive the most careful thought and the heartiest support of the membership.

It is not my purpose, in this brief paper, to offer a solution of the problems that are before this conference, but rather to give in a small way a practical view of the retail lumber conditions as have existed in the past, and as now exist, hoping to throw some light on the situation, and to show that by reason of the close touch the retailers of softwood lumber have with the buying public, they are in an excellent position to assist to a considerable degree in the educational work necessary to the successful realization of any plan that may be worked out by this conference. (Applause)

THE CHAIRMAN: That ends our program for this afternoon, I will call for a report of the resolutions committee.

Mr. Richard Lieber, Chairman, Resolutions Committee: "I will first present a number of resolutions sent in by county fish and game and forest associations of Indiana relative to forest conditions."

It was moved and seconded that the reading of the report of these resolutions be dispensed with, but that the resolutions be made a part of the record. Motion carried.

Mr. Lieber then read the report of the resolutions committee which was seconded and carried.

Resolutions sent in by the following County Organizations:

Howard County Fish, Game & Bird Protective Association, Kokomo, Ind.

Clay County Fish, Game & Bird Protective Association.

Keego Angling Club, Indianapolis, Indiana.

Foots Lake Pleasure Club, Evansville, Indiana.

Floyd County Fish & Game Protective Association, New Albany, Indiana.

WHEREAS, The timber stands and timber resources of the state are being rapidly depleted;

WHEREAS, Reforesting, both natural and artificial of cut-over and denuded areas is alarmingly inadequate;

WHEREAS, Private forestry is doing nothing to meet the situation due to increased land values and profits from the grazing industry;

WHEREAS, The removal of forests is resulting in greatly lowering the water level with resulted bad effect upon streams and water supplies, which in turn is working to decrease the fish life in our waters;

WHEREAS, The disappearance of our forests is removing the natural habitat of wild game with a great decrease in wild life which must soon result in its complete disappearance and cause a loss to sportsmen;

WHEREAS, Laws and measures for the control of timber and timber supplies are non-existant, and their absence must soon bring us to privation and want;

WHEREAS, The present conditions must soon result in the paralysis and death of our great wood-using industries;

WHEREAS, The timber and forestry resources and supplies constitute a stupendous and indispensable commodity and have no law or practice to regulate them;

RESOLVED, That laws be enacted whereby the state will acquire and plant and cause to be planted forestry acreage sufficient to insure a permanent timber supply.

RESOLVED, That lumbering be done on an economic basis, and, that the acreage be of sufficient proportions to supply all needs without impairment or reduction.

RESOLVED, That the tax law should be so amended as to make it possible and profitable to maintain the necessary wood lot on farms.

RESOLVED, That the public, commercial and technical interests should co-operate to the end that a permanent timber supply will be assured.

RESOLVED, That a copy of these resolutions be sent to federal and state senators and representatives with the request that they use their best endeavors to secure the passage of laws as herein set forth to the lasting benefit and security of all.

RESOLUTIONS TRI-STATE FORESTRY CONFERENCE.

WHEREAS, The forests of the states of Ohio, Illinois and Indiana have been practically depleted and but little timber remains in the New England and the northeastern sections of the United States. The southern forests which have been the main source of supply for these three states will be exhausted within the next decade or two;

WHEREAS, There is a large portion of cut-over timber land on rugged topography and poor soil which is not adaptable to profitable agriculture and which should be growing forests for our future supply. A large part of that which is being farmed will soon be completely lost by erosion;

WHEREAS, The price of timber is rapidly increasing, consequent upon the decrease of the supply;

WHEREAS, The practice of forestry on essentially timber land is discouraged by the present system of taxation. The possibility of an annual cash income from the growing of tobacco and small fruits, and grazing, further discourage forests;

WHEREAS, in the large share of cases it is impractical and unprofitable for private interests to use their land in the growth of timber, since the investment must run for a long term of years. The state can best meet a situation which requires the investment of large funds for many years, through the purchase of public lands for reforestation;

WHEREAS, There are four thousand wood-using industries in Ohio, Illinois and Indiana whose main source of supply was native-grown timber which, if the present supply is not maintained, must perish, move to the source of supply, or bring in materials at a greatly increased cost;

EMPLOYES

	Illinois	Indiana	Ohio
All Industries	620,000	265,000	600,000
Wood-Using Industries	140,000	70,000	90,000

CAPITAL

All Industries	$2,000,000,000	$675,000,000	$1,675,000,000
Wood-Using Industries	400,000,000	175,000,000	160,000,000

PRODUCTS

	Illinois	Indiana	Ohio
All Industries	$2,250,000,000	$730,000,000	$1,785,000,000
Wood-Using Industries	320,000,000	140,000,000	175,000,000

WHEREAS, There is a large annual economic waste due to forest fires, since, in the three states concerned, there has been no system of forest fire protection developed;

WHEREAS, There is great need of an extensive and thorough campaign for the purpose of educating the public to the extremity of the forest situation and the necessity of action;

WHEREAS, The forestry situation and threatening condition of the wood-using industries requires immediate action to the end that a policy may be adopted and legislation enacted which will insure a permanent supply of timber;

THEREFORE, BE IT RESOLVED, by the Tri-State Forestry Conference of Ohio, Illinois and Indiana, convened at Indianapolis, on October 22nd, and 23rd, 1919, the Governors of the respective states concurring therein, that the attention of the public and legislatures of the said states, be called to the necessity of legislative action which will lead to the assurance of a permanent timber supply.

BE IT RESOLVED, That a system of taxation on timberlands be adopted which will discourage premature and wasteful cutting and encourage forest renewal.

BE IT RESOLVED, That the states should greatly increase their forest holdings by purchase of young-second-growth and land adapted to reforestation, made possible by a bond issue of fifty to one hundred years' maturity, so the burden may be equally distributed through generations.

Urging that large holdings by the states will present a steady and permanent source of supply which will stabilize timber prices.

RESOLVED, That this conference urges upon our representatives in congress the necessity for largely increased appropriations under the purchase clause of the Weeks Act, to extend the area of national forests and particularly into the hardwood regions of West Virginia, Kentucky and Tennesse from which the three states concerned already draw a large portion of their hardwood supply.

Be it further urged that the federal congress appropriate adequate funds for co-operation with the states in forestry, as it is doing in road building, agricultural extension, vocational education and other activities, with the especial object of encouraging farm forestry extension under the Smith-Lever Act, reforestation of idle lands and protection against fire.

BE IT RESOLVED, That the states launch an extensive and thorough campaign through the press, the schools, the pulpit and mails, to arouse the public to the need of a State Forest Policy and necessity of action toward the assurance of a permanent timber supply.

It is furthermore urged that forestry education should be made a progressive part of the public school curriculum.

BE IT RESOLVED, That the work of the Tri-State Forestry Conference continue through State Forestry Educational Committees, these committees to be formed independently in each of the three states under the direction of the state official having forestry in charge and to select from their number three persons, to serve on an executive committee governing the policies of the participating states.

BE IT RESOLVED, That the conference expresses the appreciation of the work of the Governor of Indiana for calling the congress, the representatives of the Federal Forest Service, officers of other states who contributed their presence and papers, the War Department and the New York Conservation Commission for the loan of films and the press for their hearty support.

BE IT RESOLVED, That a copy of these resolutions be transmitted to the President of the United States, the Chairman of the Agricultural Committee, and House of Representatives, to our representatives in Congress, the Legislatures of Ohio, Illinois and Indiana, the Governors of the said States, the Forester of the United States, and the President of the American Forestry Association.

ADJOURNMENT.